

FIG. 1A



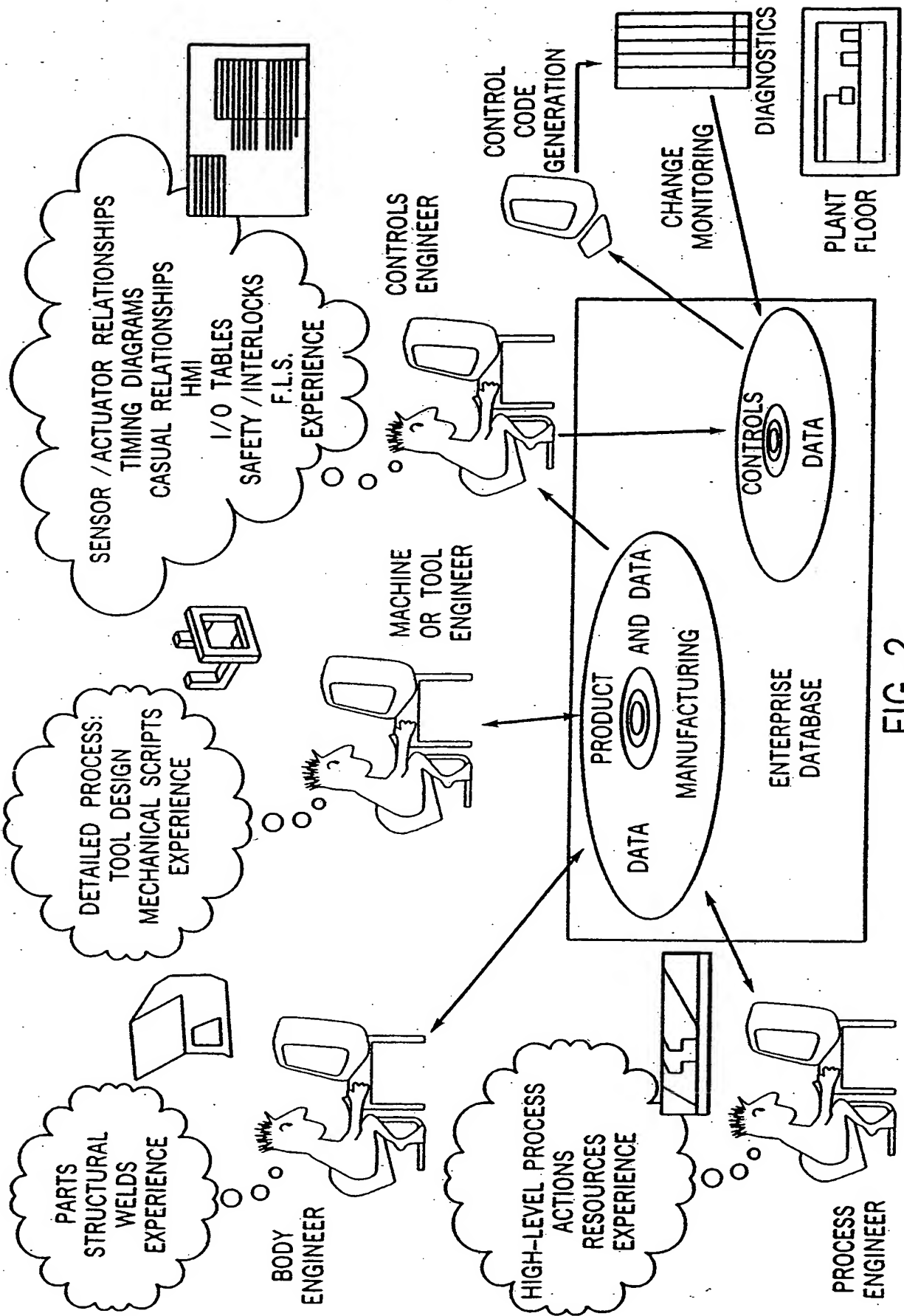


FIG. 2

**Microsoft Access**

File Edit View Insert Format Records Tools Window Help

The machine resource database has two parts: A catalog or library that describes control assemblies, configurations of components that perform distinct control functions, that can be used in a machine resource description and a set of tables used to

### Control Assemblies with Physical Components

Total number of catalog entries with Physical Components

Previous ◀ Next ▶ Control Assembly Catalog ID

This is labeled as "safe" clamp because it needs to have two air valves

safe-bulkheadclamp

The following is a list of the physical components that make up a control assembly of this type:

Element Type	Subtype	Role	Manufacturer	Max	Min
▷ airvalve	◻ doublesolenoid	main control	Numatics	1	1
airvalve	◻ singlesolenoid	safety valve	Numatics	1	2
aircylinder	◻ Cylinderator	air-motion coverter	Namco	9999	3
clampbody	◻ none	clamp	9999	9999	4
*	◻ none		0	0	umber

To see the I/O associated with a component, click at the beginning of the row, and then click on this button See I/O

Actions this assembly can perform:

Open 1

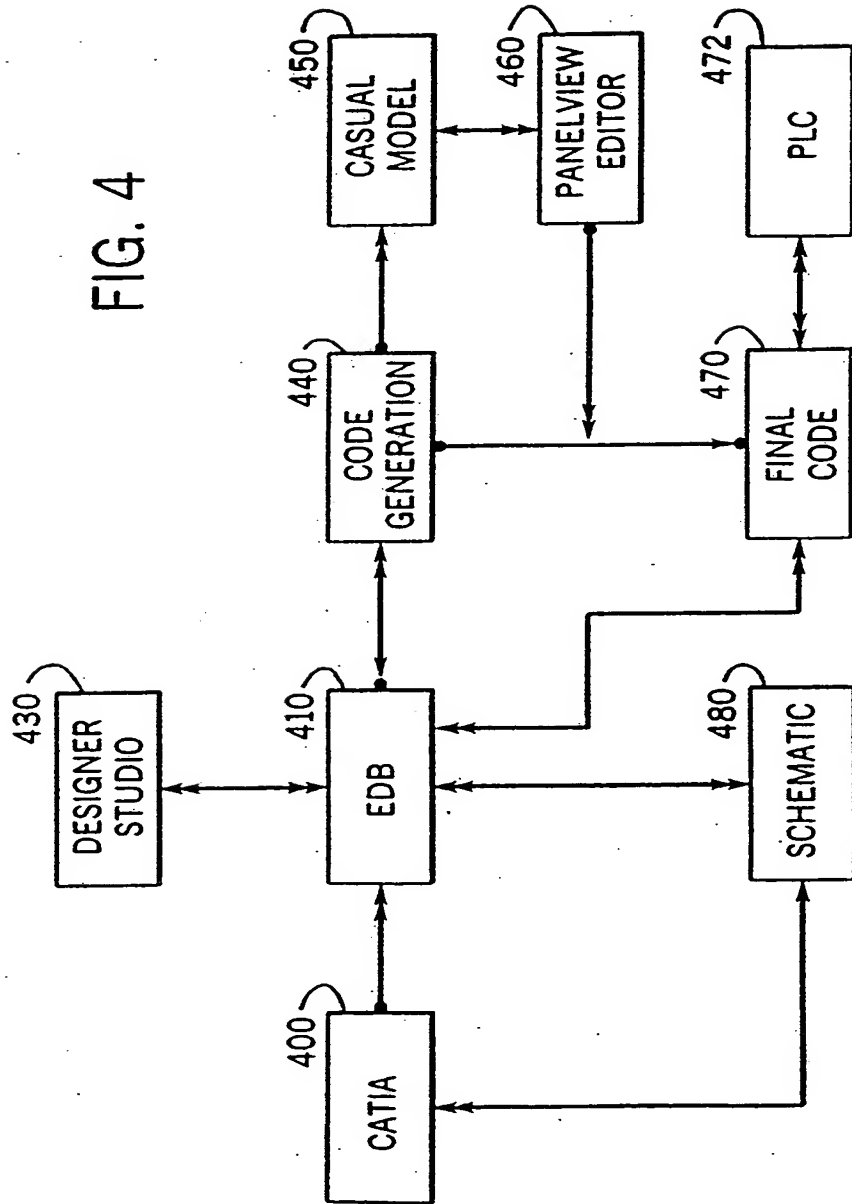
Close 1 2

☐ Main Menu  
☐ Structural Components subform  
☐ WorkCell

F/G. 3



FIG. 4



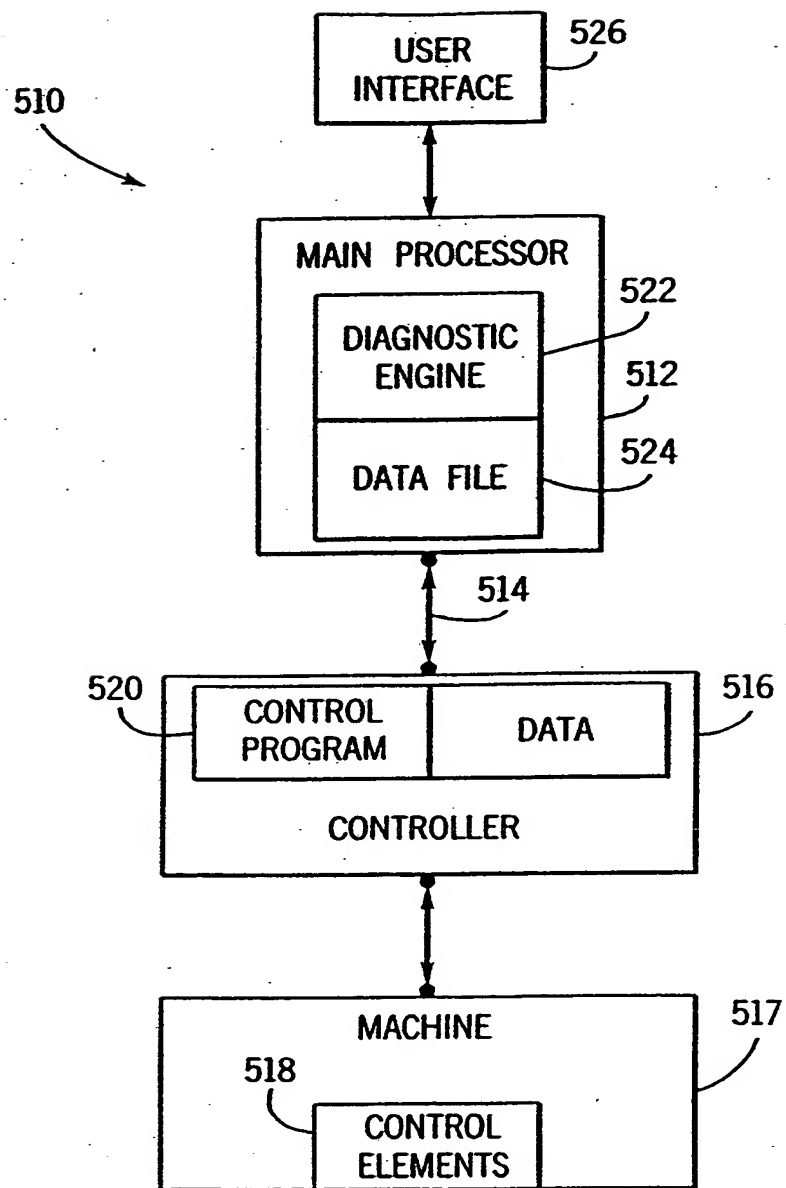


FIG. 5A

FIG. 5B

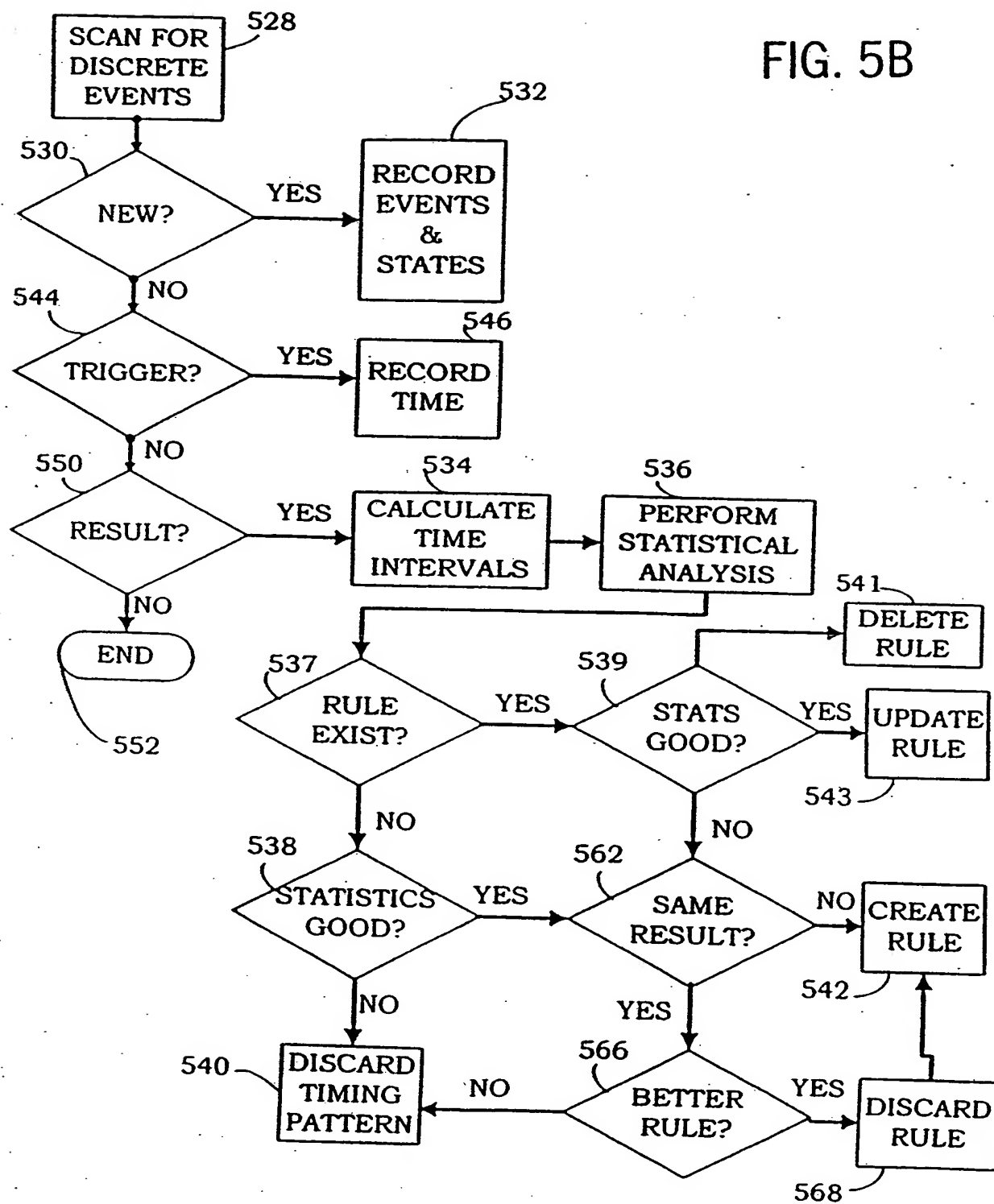
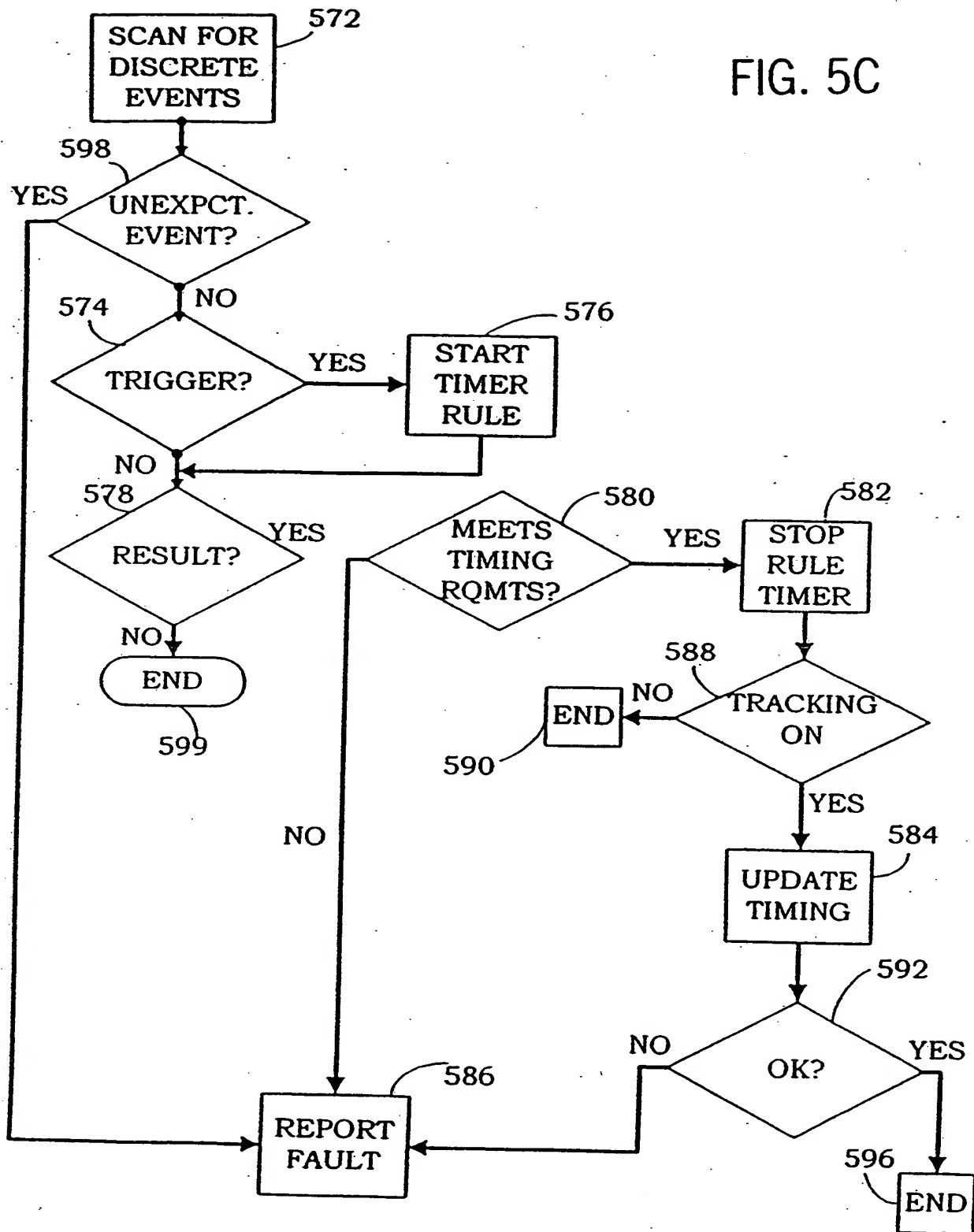


FIG. 5C



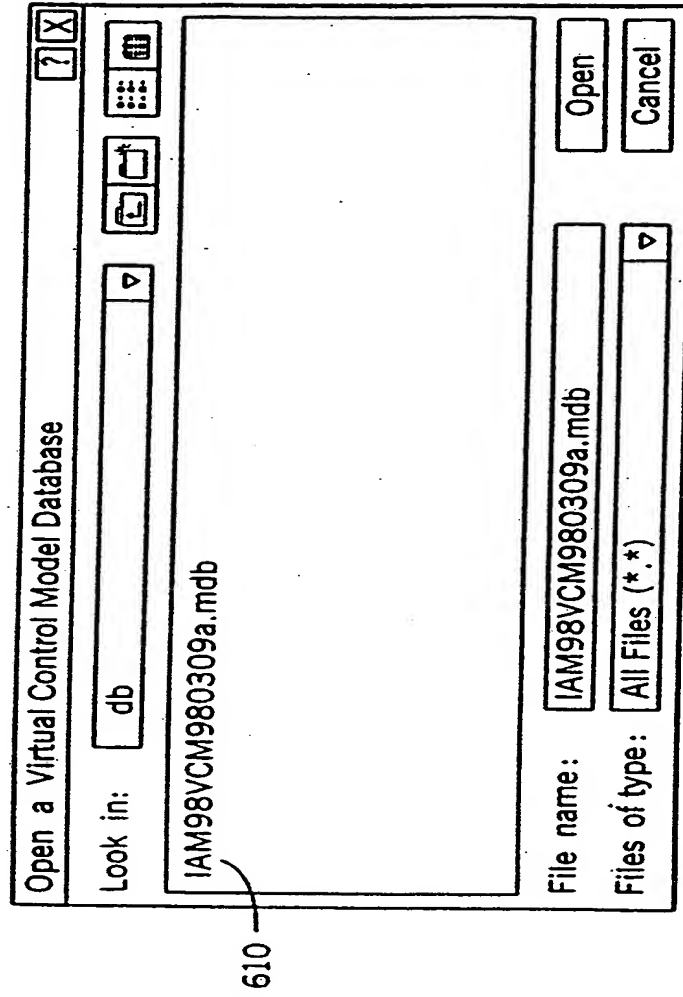


FIG. 6

FIG. 7

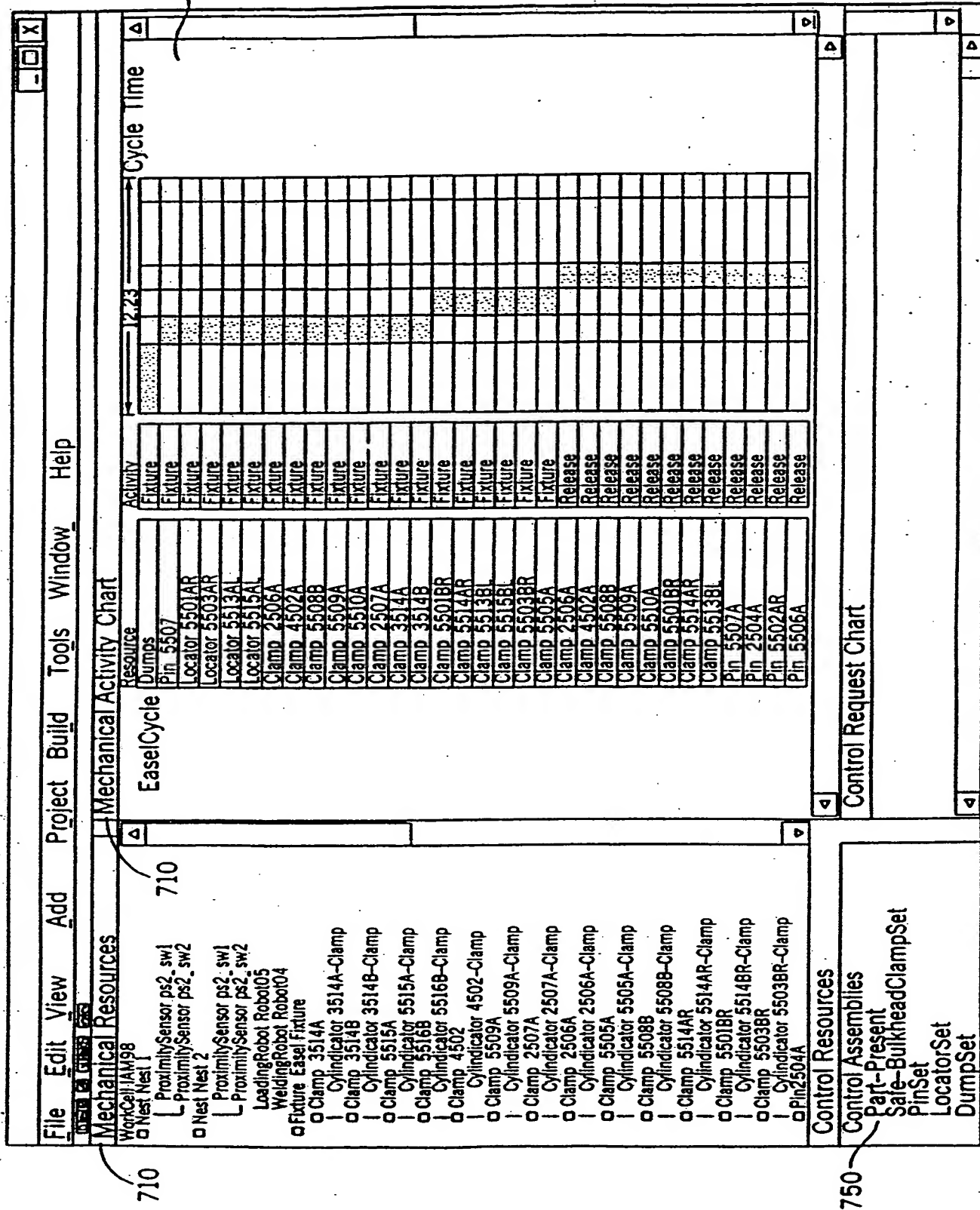
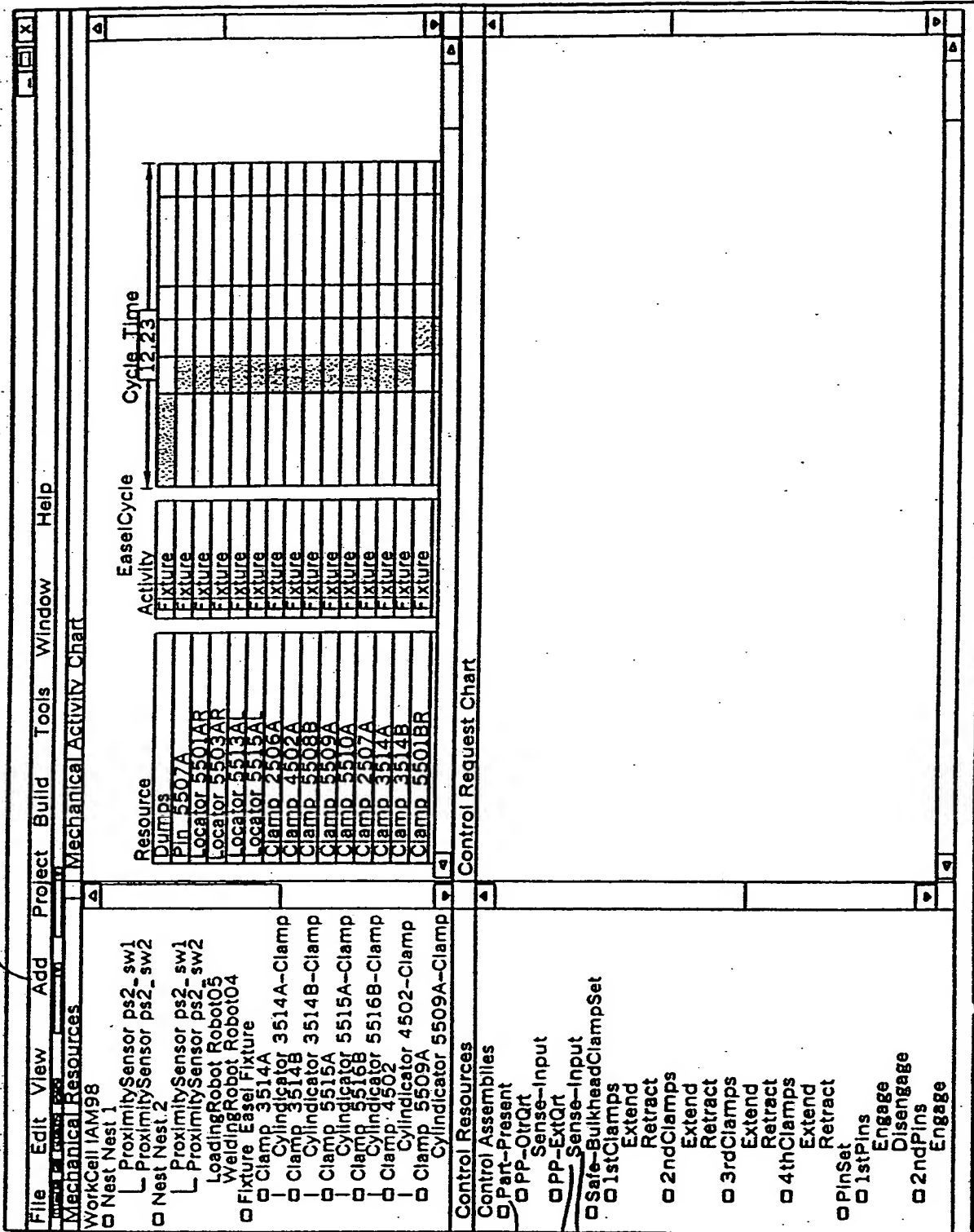


FIG. 8

840



810

820

830

FIG. 9

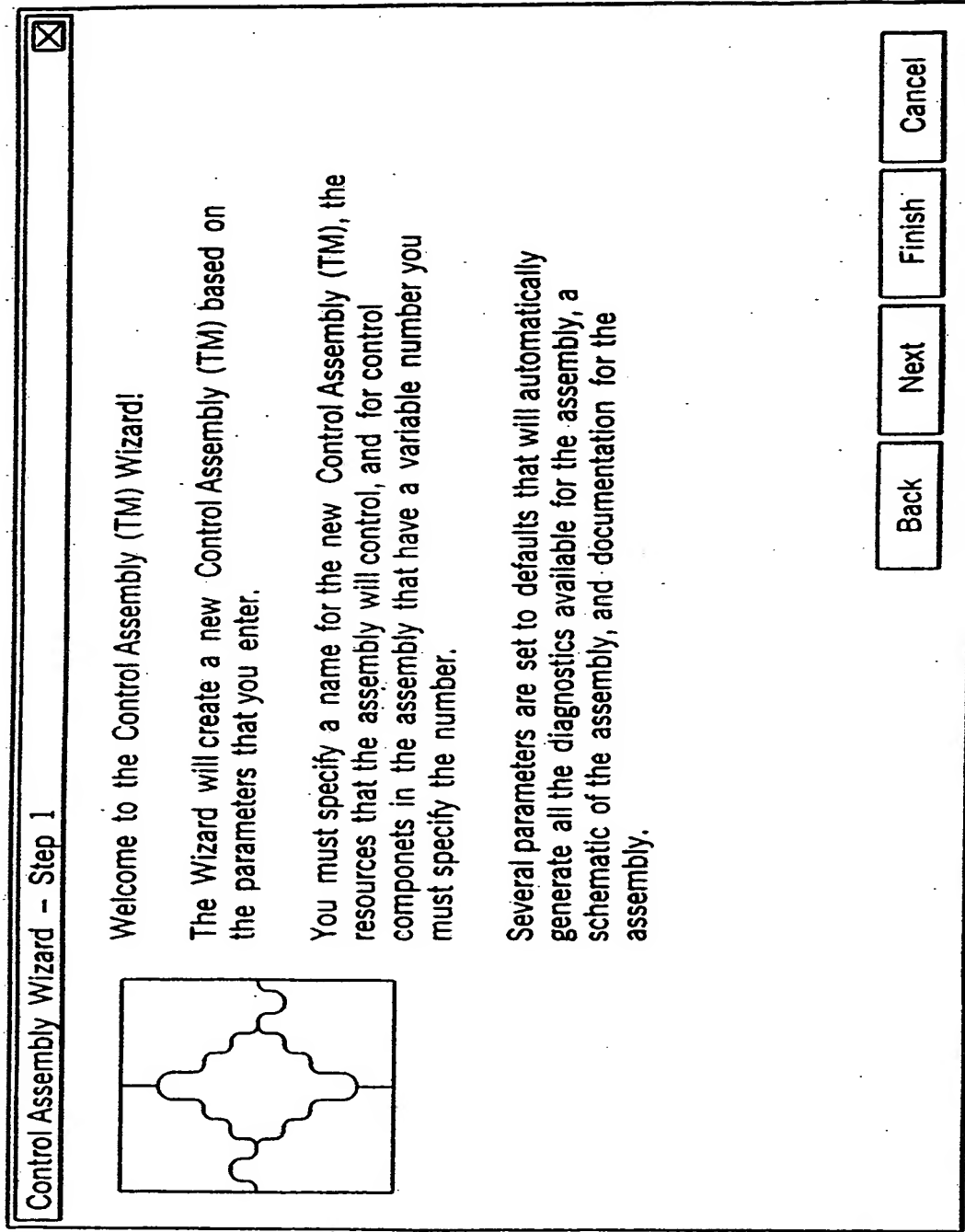
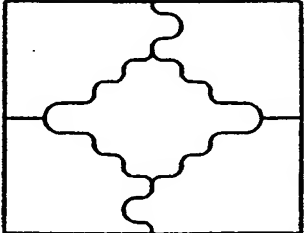




FIG. 10

Control Assembly Wizard -- Step 2 of 5



Control Assembly Type:  
safe-bulkheadclampset

Specify name for the new Control Assembly 1000

Test

☒ Create Wiring Diagram for the assembly

☒ Create all available Diagnostics for the assembly

☒ Create Documentation for the assembly

Back

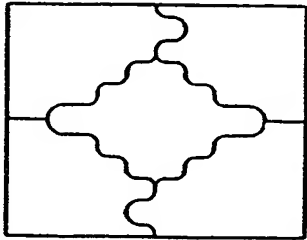
Next

Finish

Cancel

FIG. 11

Control Assembly Wizard - Step 3 of 5



Choose resources of type Clamp  
that safe-bulkheadclampset will control:

Available resources

Clamp 5505A  
Clamp 3514A  
Clamp 2506A  
Clamp 5508B  
Clamp 5514AR  
Clamp 5501BR  
Clamp 5503BR  
Clamp 2507A

1100

Controlled resources

Clamp 3514B  
Clamp 5515A  
Clamp 5516B  
Clamp 4502  
Clamp 5509A

1110

Add

Remove

Back

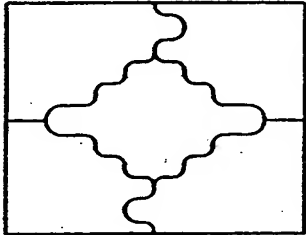
Next

Finish

Cancel

FIG. 12

Control Assembly Wizard - Step 4 of 5



1200

Test

Control Assembly contains the following control components (suggested labels are supplied; you may replace them as needed):

Label	Control Component	Type	Function
Clamp 3514B	airvalve	doublesolenoid	main control
Clamp 5515A	airvalve	singlesolenoid	safety valve
Clamp 5516B	aircylinder	Cylindicator	air-motion coverter
Clamp 4502	aircylinder	Cylindicator	air-motion coverter
Clamp 5509A	aircylinder	Cylindicator	air-motion coverter
	aircylinder	Cylindicator	air-motion coverter

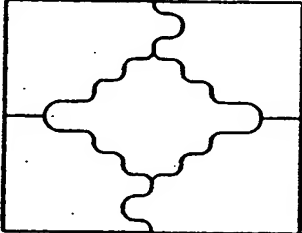
Back

Next

Finish

Cancel

Control Assembly Wizard - Step 5 of 5



New Control Assembly Summary

Control Assembly Wizard will create a new control assembly following specifications:

Control Assembly Type: Safe-BulkHeadClampSet

Control Assembly Info:  
Name: Test  
Author: Josiah Hoskins  
Date: Mon Mar 16 13:54:53 CST 1998  
Organization: Rockwell Automation  
Tool: Rockwell Automation Enterprise Controls Development

Project Info:  
Name: IAM 98 Demo  
Workspace: Database Name

Back

Next

Finish

Cancel

FIG. 13

FIG. 14

File Edit View Add Project Build Tools Window Help									
Mechanical Resources									
WorkCell IAM98									
<input type="checkbox"/> Nest Nest 1 <input type="checkbox"/> ProximitySensor ps2_sw1 <input type="checkbox"/> ProximitySensor ps2_sw2 <input type="checkbox"/> Nest Nest 2 <input type="checkbox"/> ProximitySensor ps2_sw1 <input type="checkbox"/> ProximitySensor ps2_sw2 LoadingRobot Robot05 WeldingRobot Robot04 <input type="checkbox"/> Fixture Easel Fixture 1410 <input type="checkbox"/> Clamp 3514A 3514A-Clamp <input type="checkbox"/> CylinderIndicator 3514B 3514B-Clamp <input type="checkbox"/> CylinderIndicator 3514B 3514B-Clamp <input type="checkbox"/> Clamp 5515A 5515A-Clamp <input type="checkbox"/> CylinderIndicator 5516B 5516B-Clamp <input type="checkbox"/> CylinderIndicator 5516B 5516B-Clamp <input type="checkbox"/> Clamp 4502 4502-Clamp <input type="checkbox"/> CylinderIndicator 4502 4502-Clamp <input type="checkbox"/> Clamp 5509A 5509A-Clamp <input type="checkbox"/> CylinderIndicator 5509A 5509A-Clamp									
Mechanical Activity Chart									
Resource		Activity		EaselCycle		Cycle Time			
Dumps		Fixture							
Pin 5507A		Fixture							
Locator 5503AR		Fixture							
Locator 5513AL		Fixture							
Locator 5515AL		Fixture							
Clamp 2506A		Fixture							
Clamp 4502A		Fixture							
Clamp 5508B		Fixture							
Clamp 5509A		Fixture							
Clamp 5510A		Fixture							
Clamp 2507A		Fixture							
Clamp 3514A		Fixture							
Clamp 5501BR		Fixture							
Clamp 5514AR		Fixture							
Clamp 5513BL		Fixture							
Control Request Chart									
Control Resources		Control Assembly		EaselCycle		Cycle Time			
Control Assemblies		Request							
<input type="checkbox"/> Part-Present		Sense-Part							
<input type="checkbox"/> PP-ExtQrt		Engage							
<input type="checkbox"/> Sense-Input		Extend							
<input type="checkbox"/> Sense-Input		Engage							
<input type="checkbox"/> Safe-BulkheadClampSet		Extend							
<input type="checkbox"/> 1stClamps		Extend							
<input type="checkbox"/> 2ndClamps		Extend							
<input type="checkbox"/> 3rdClamps		Extend							
<input type="checkbox"/> 4thClamps		Return							
<input type="checkbox"/> PinSet		Return							
<input type="checkbox"/> 1stPins		Return							
<input type="checkbox"/> Engage		Disengage							
<input type="checkbox"/> Disengage		Disengage							
<input type="checkbox"/> 2ndPins		Return							
<input type="checkbox"/> Engage		Return							
<input type="checkbox"/> Disengage		Return							
<input type="checkbox"/> LocatorSet		Disengage							
Safety Gate									

1400

FIG. 15

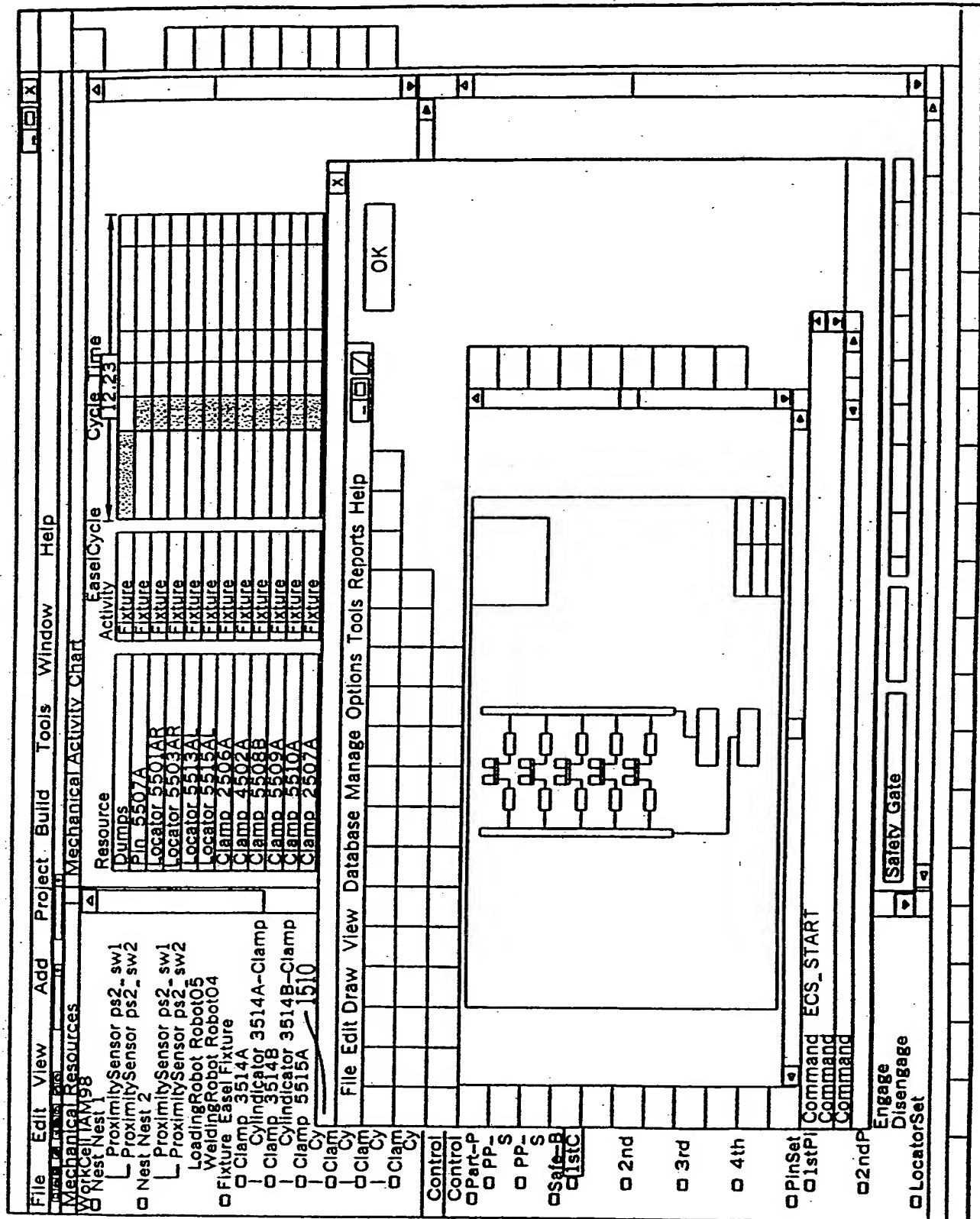


FIG. 16

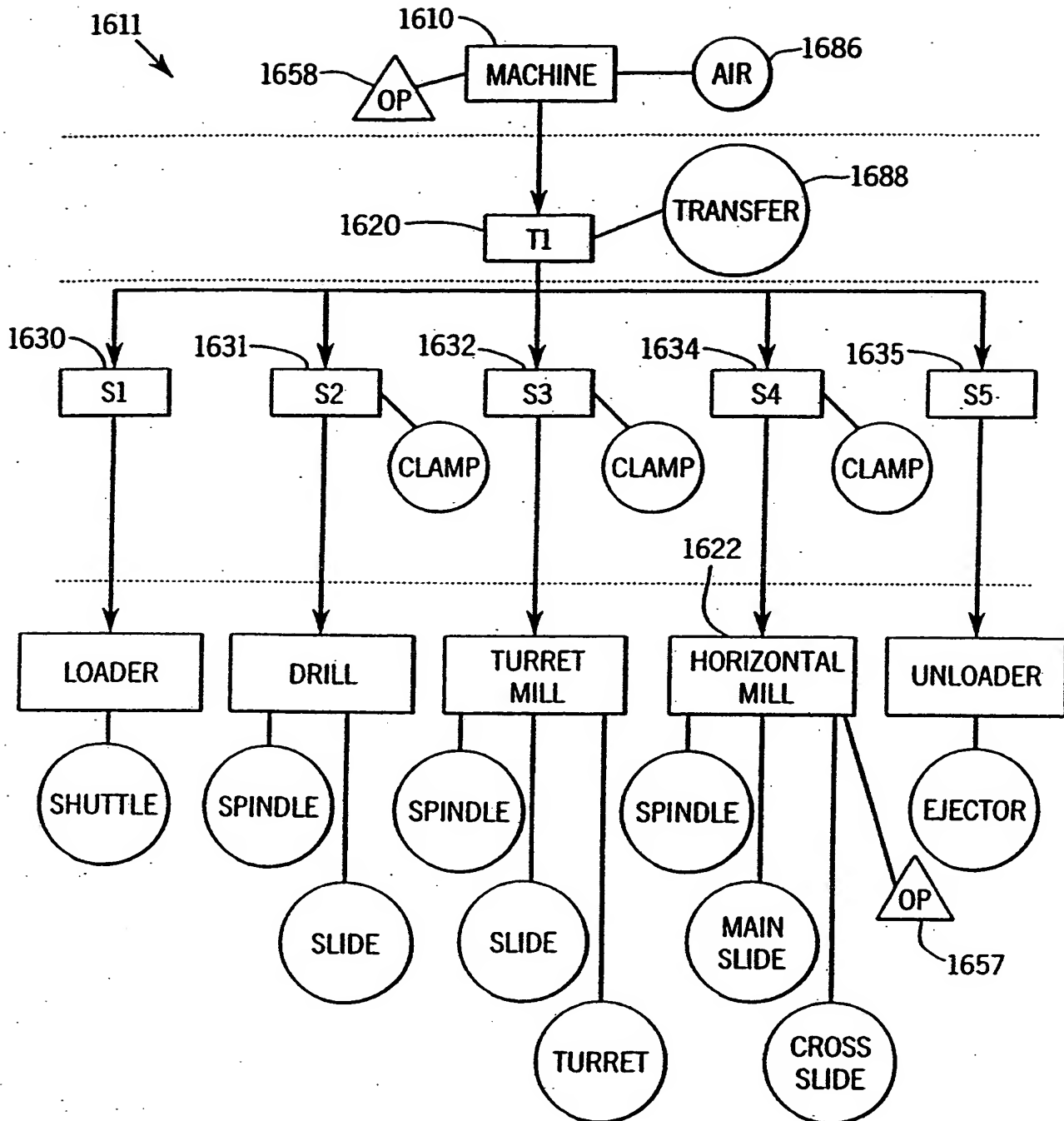


FIG. 17

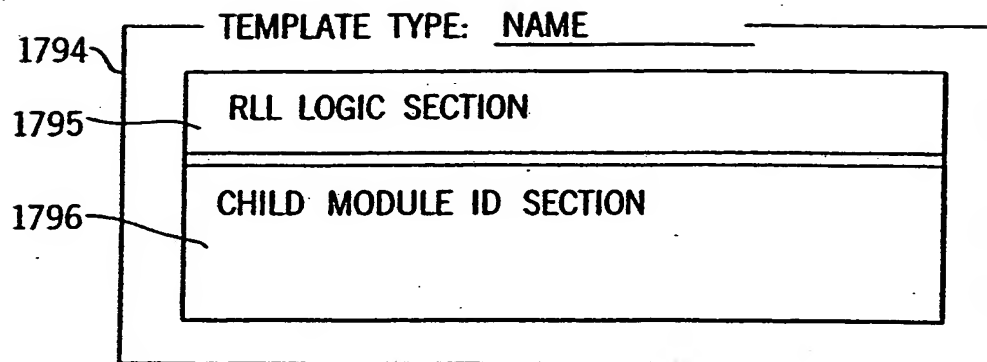


FIG. 23

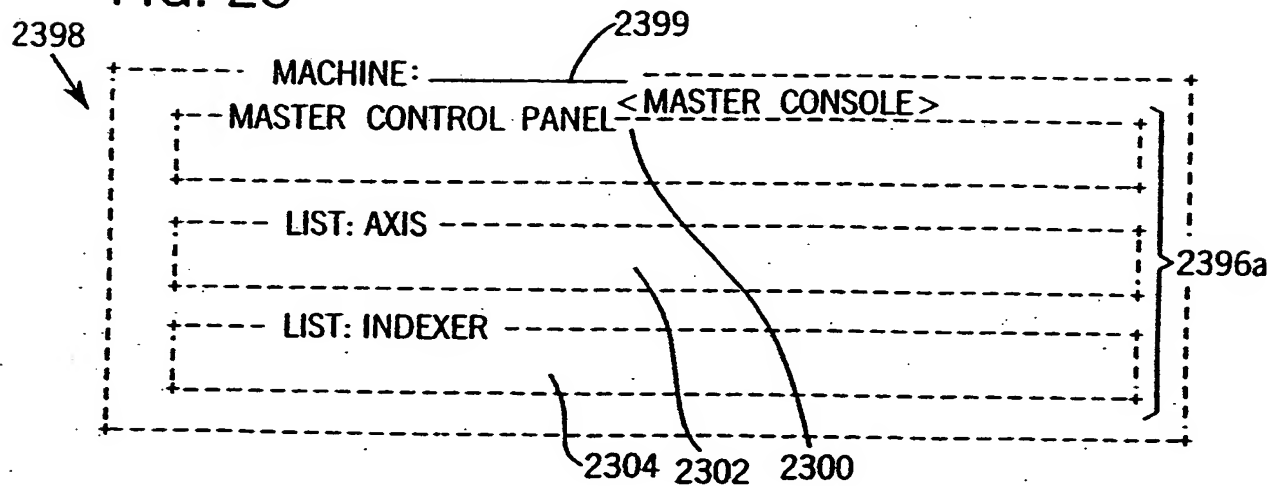




FIG. 18

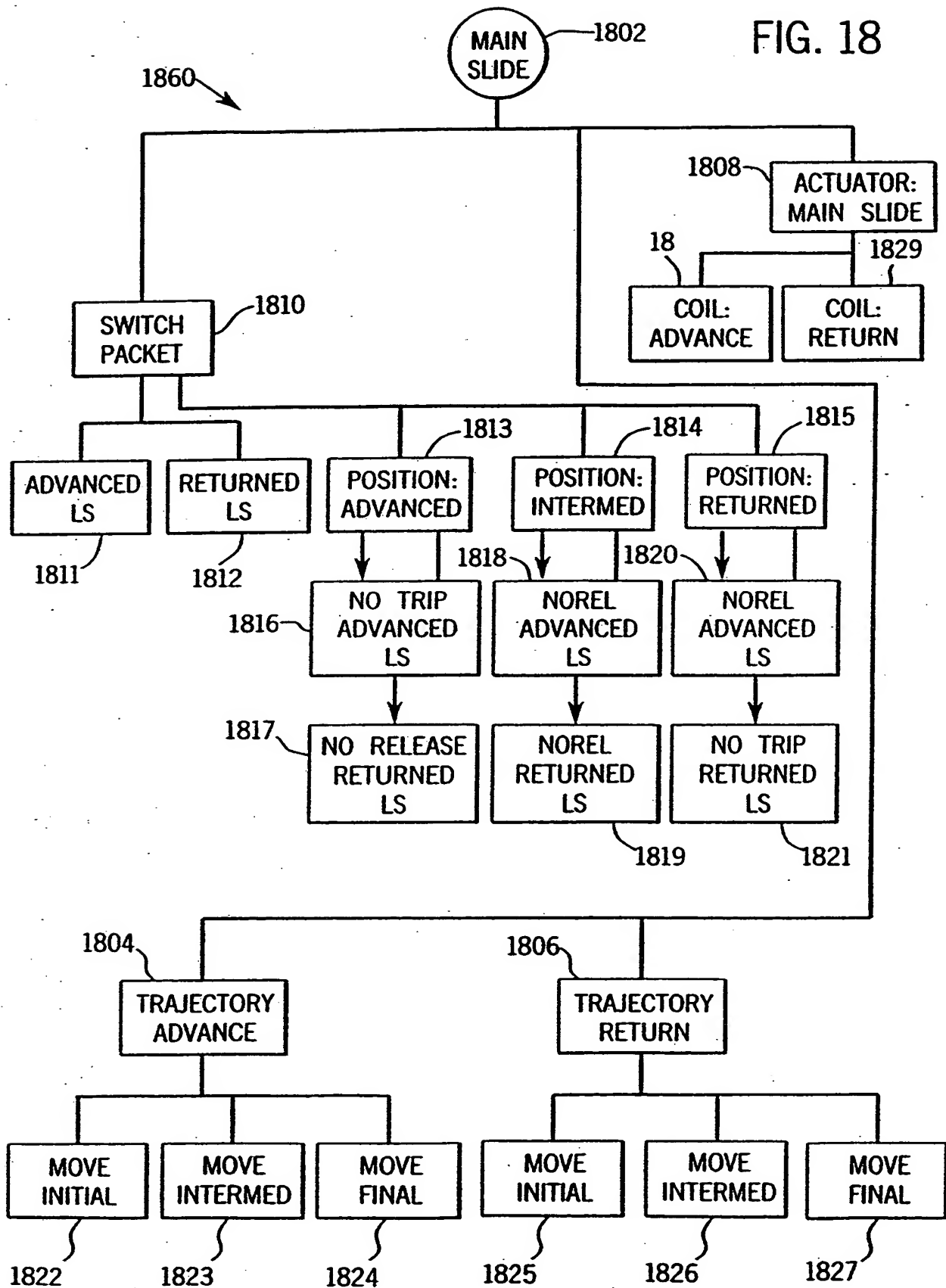


FIG. 19

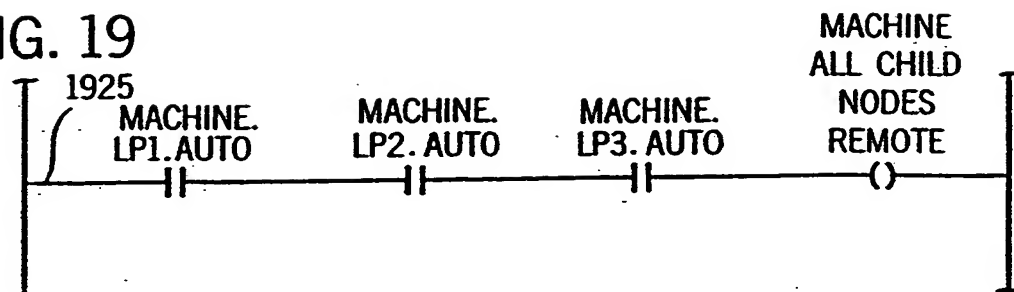


FIG. 20

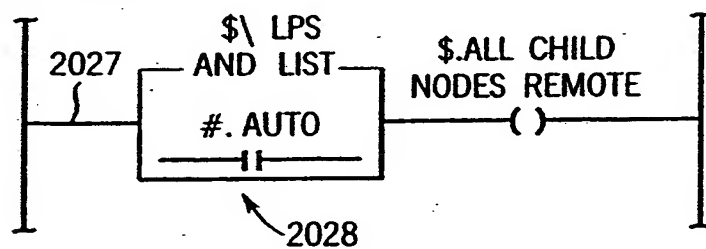


FIG. 21

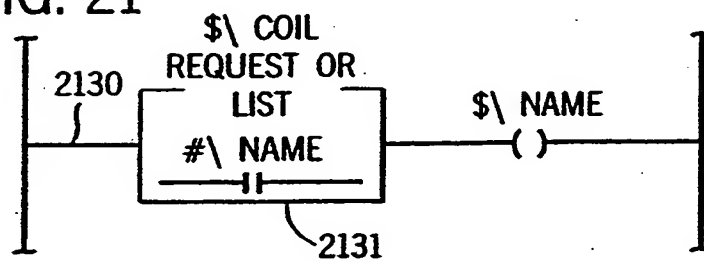


FIG. 22

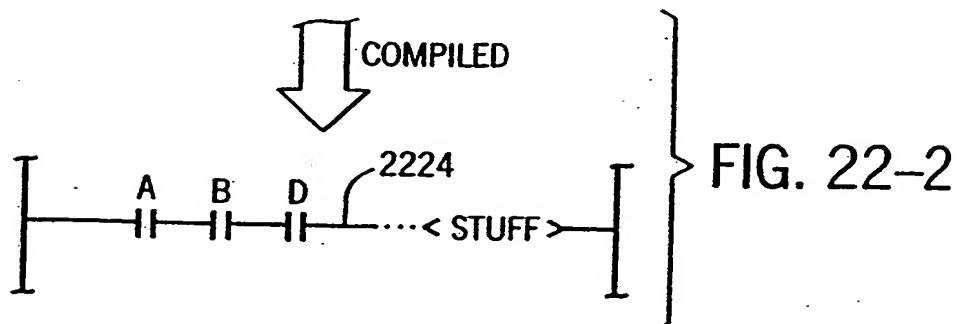
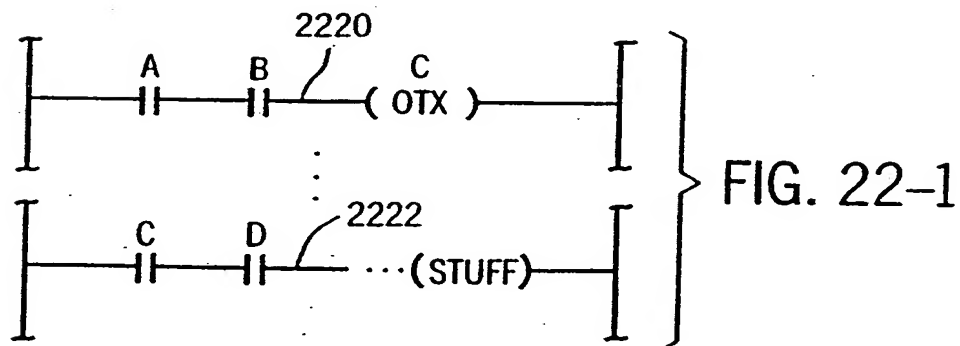
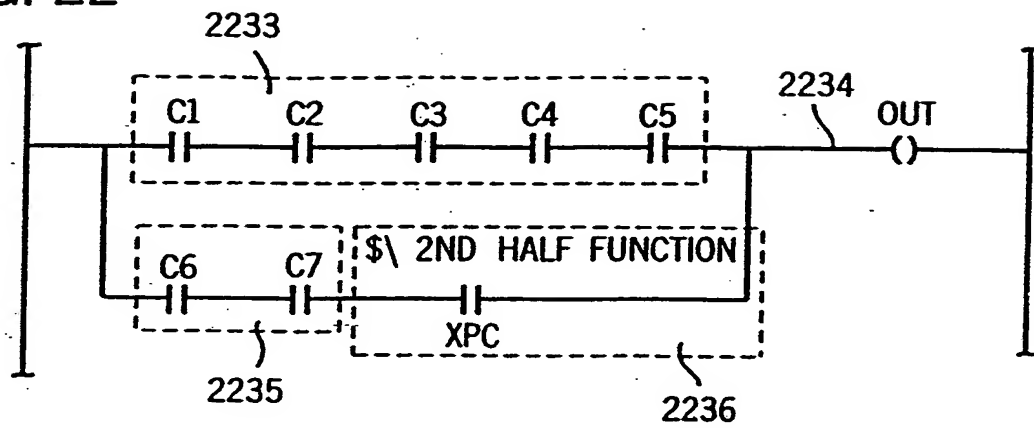


FIG. 24

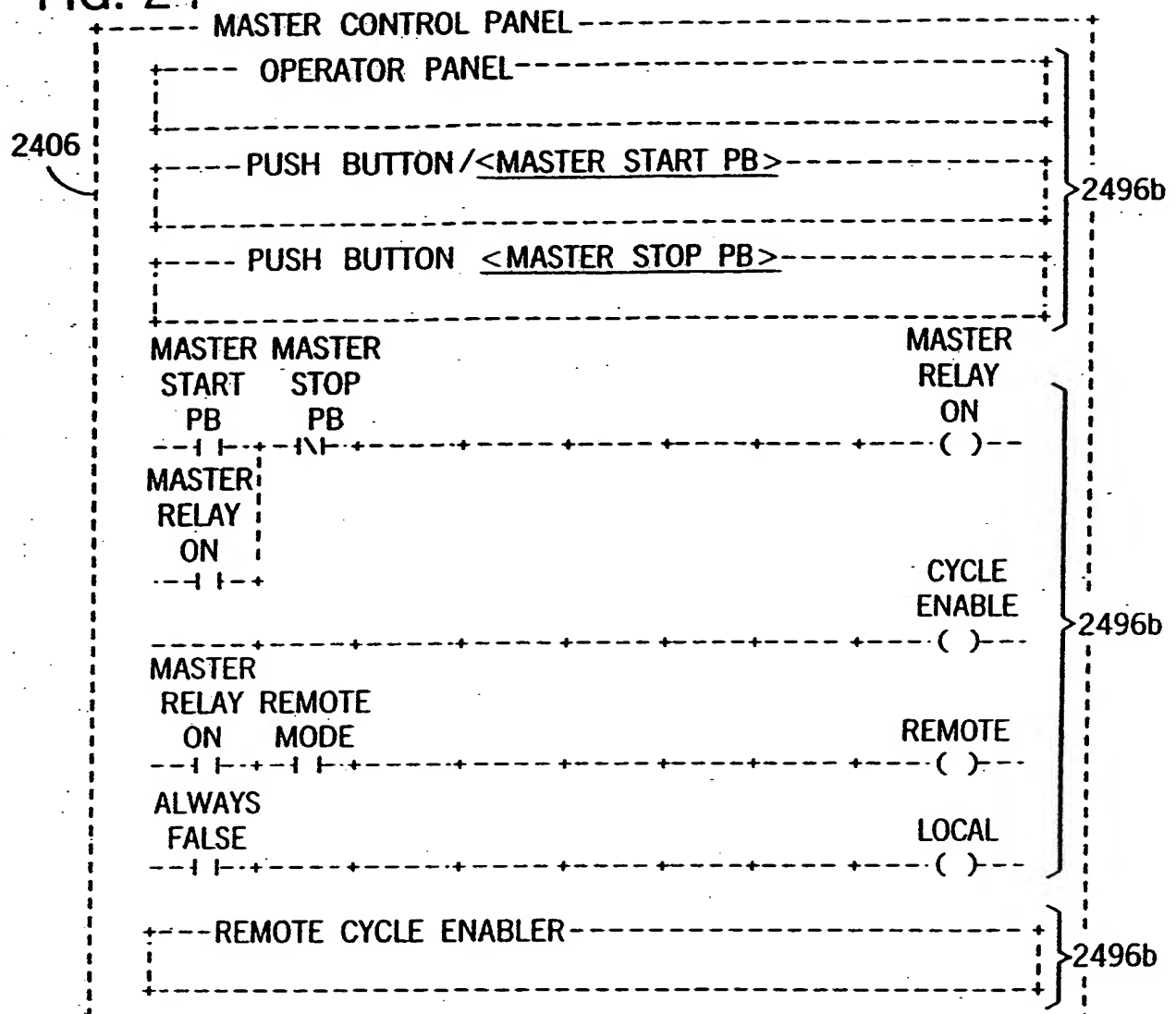


FIG. 25

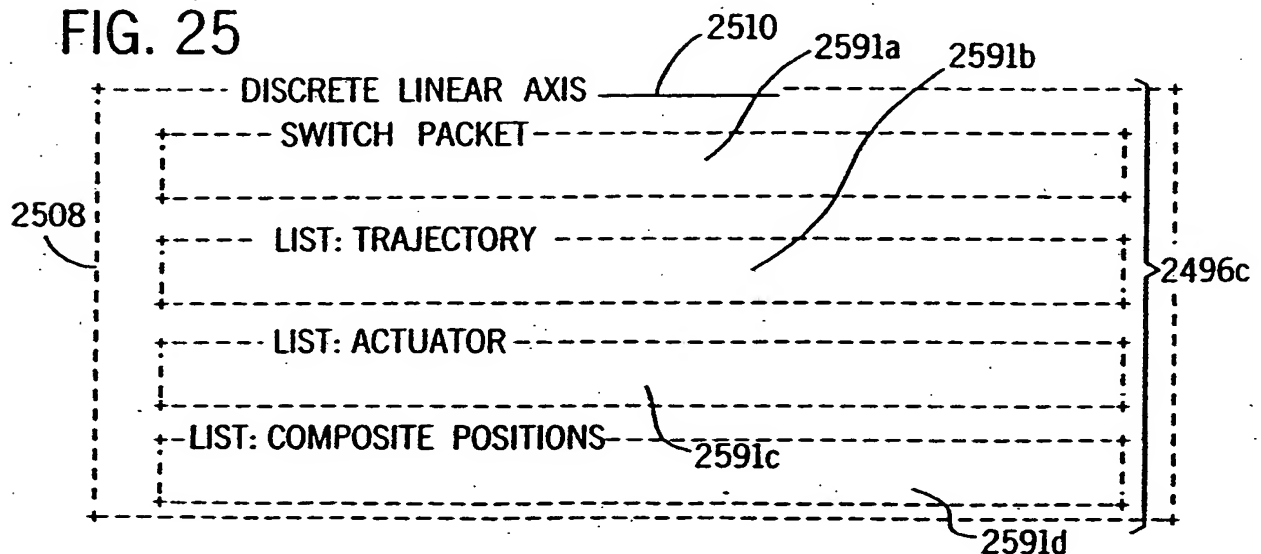


FIG. 26

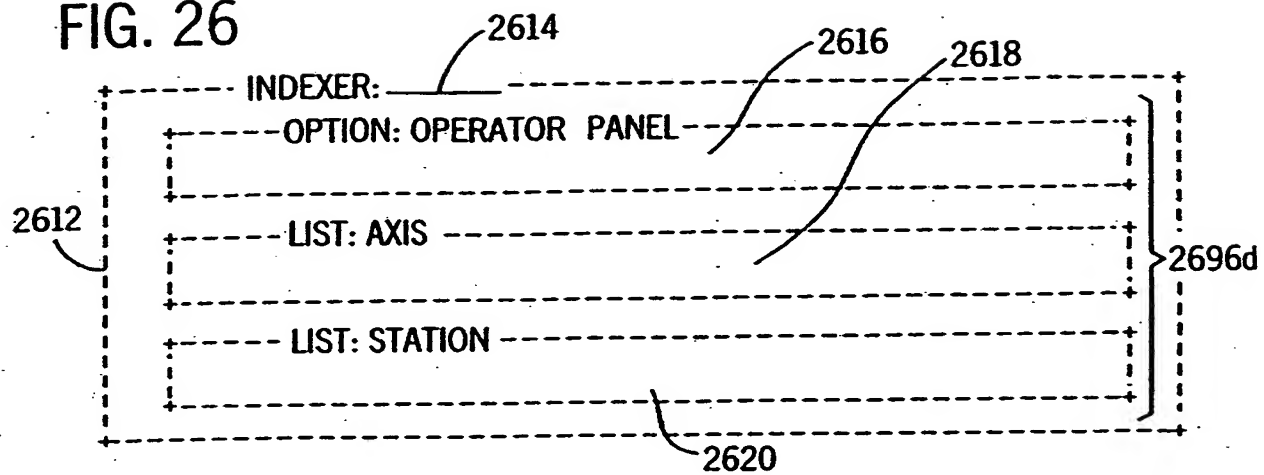


FIG. 27

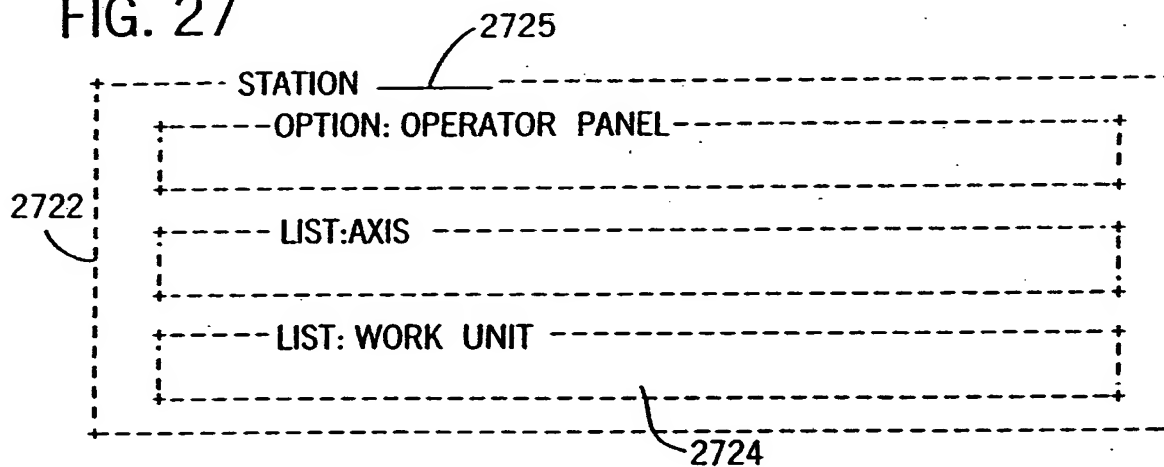


FIG. 28

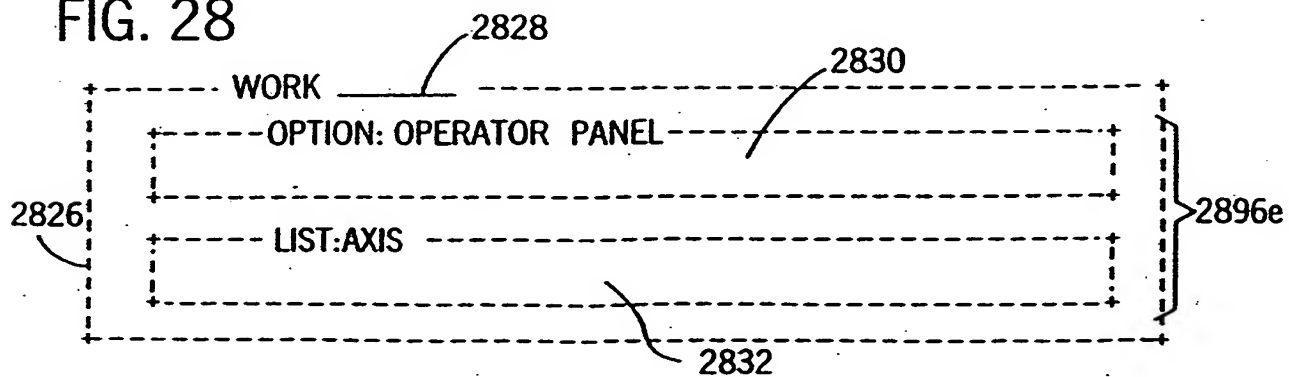


FIG. 29

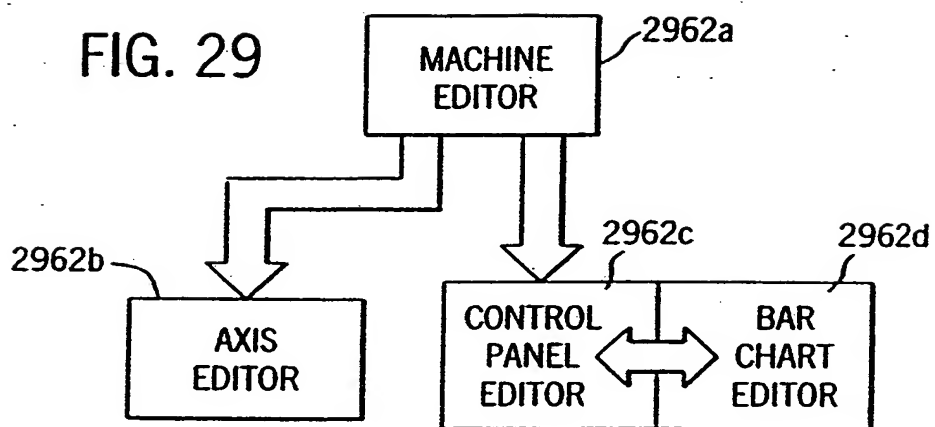


FIG. 30

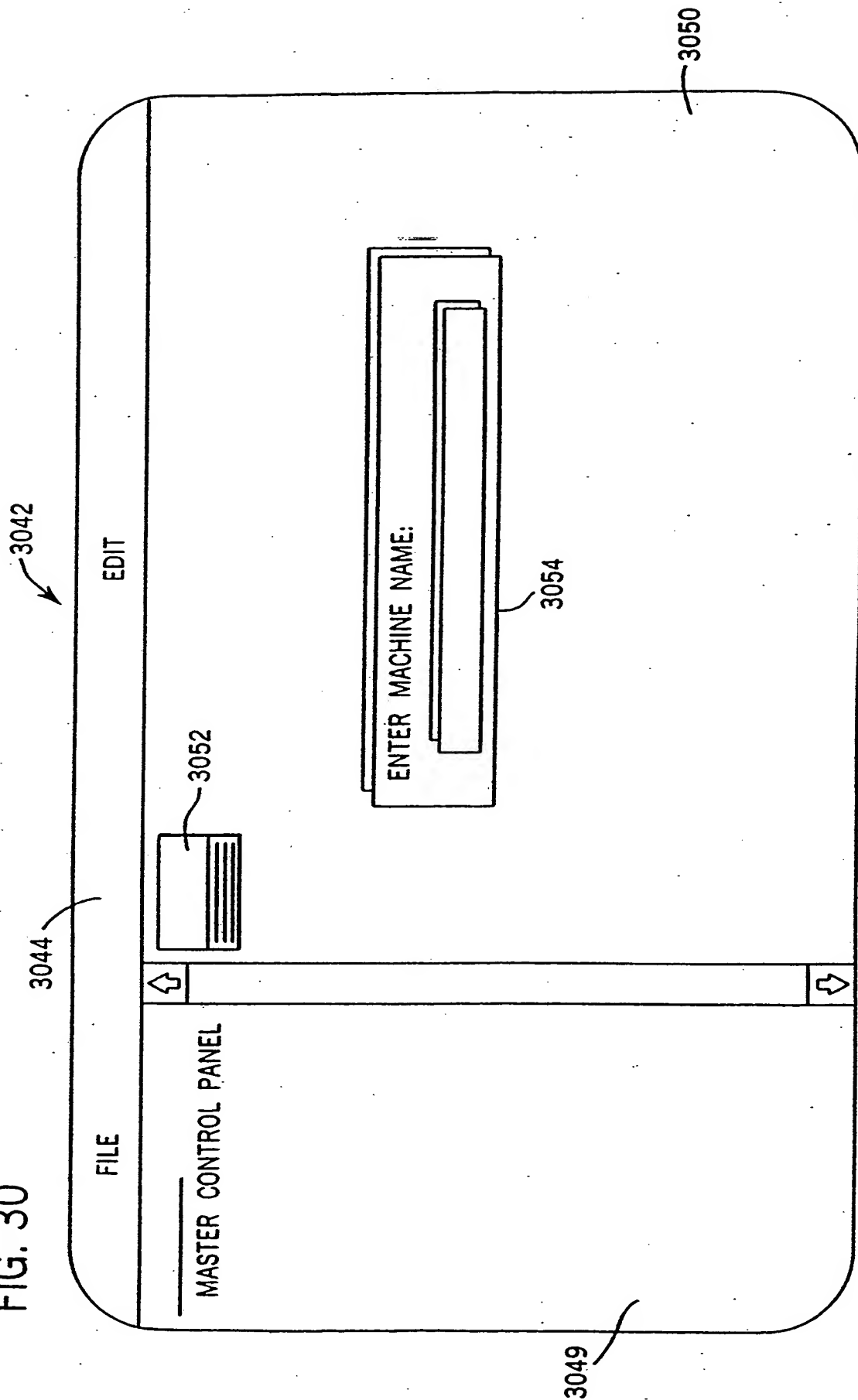
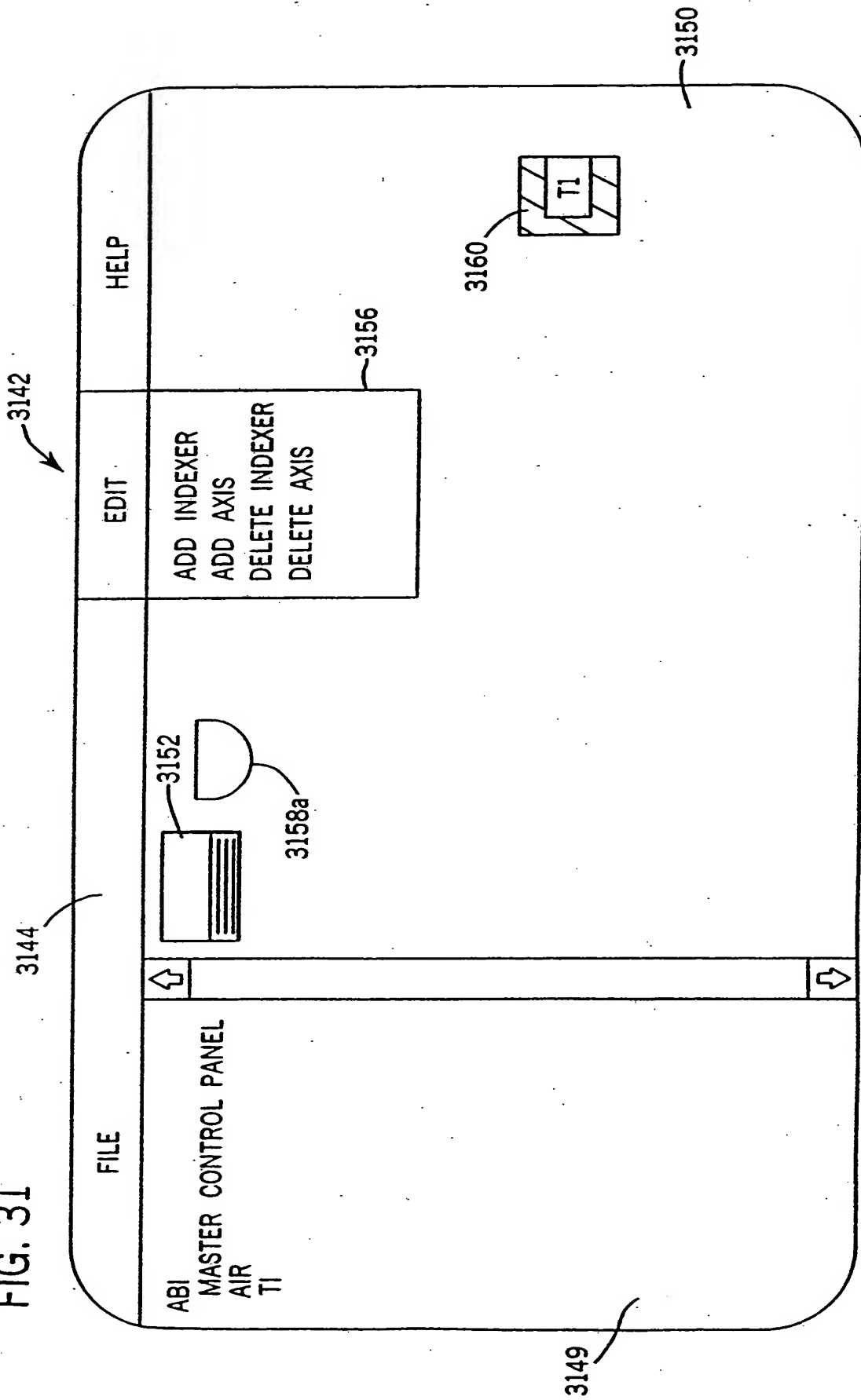


FIG. 31





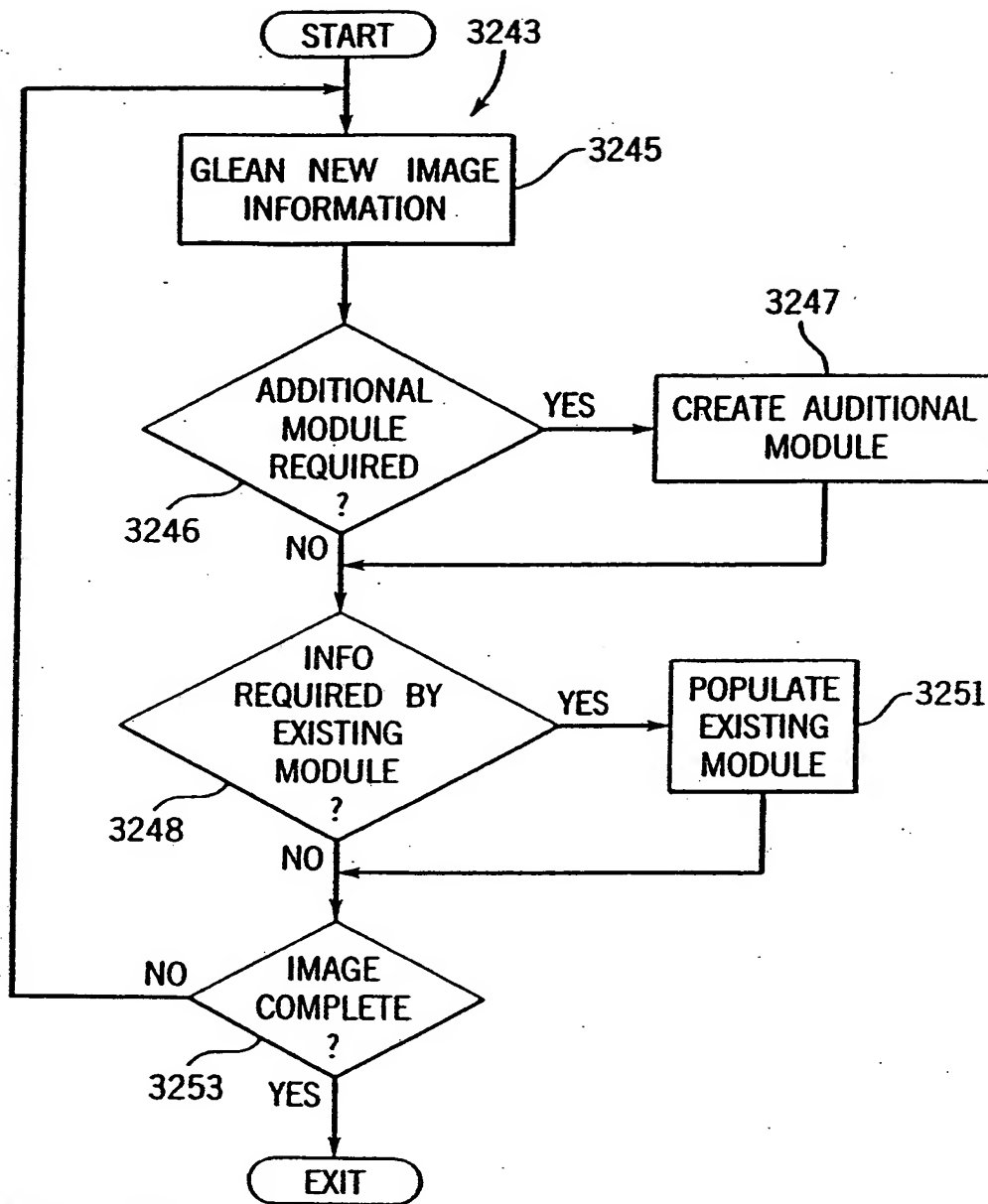


FIG. 32

FIG. 33

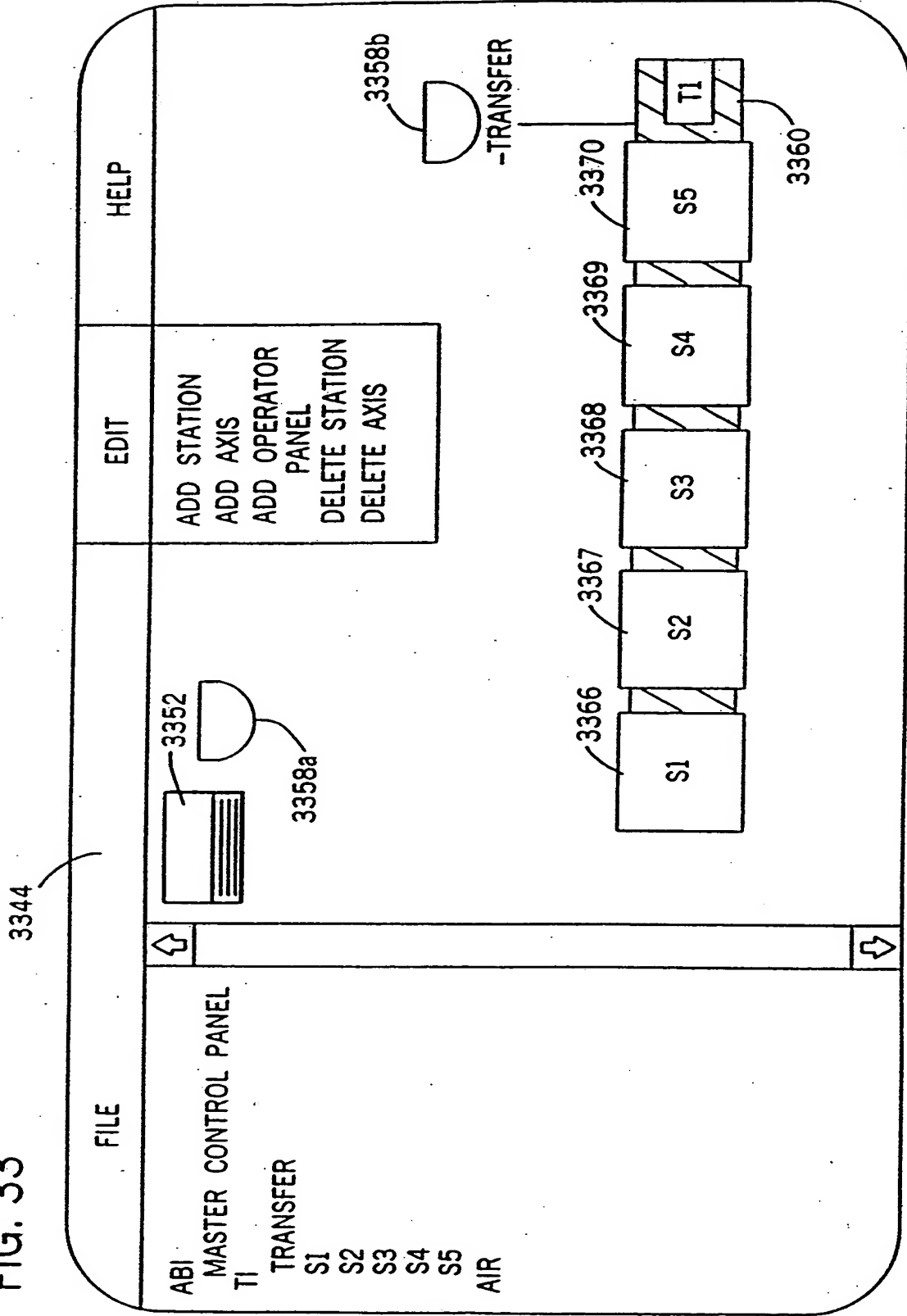


FIG. 34

3444

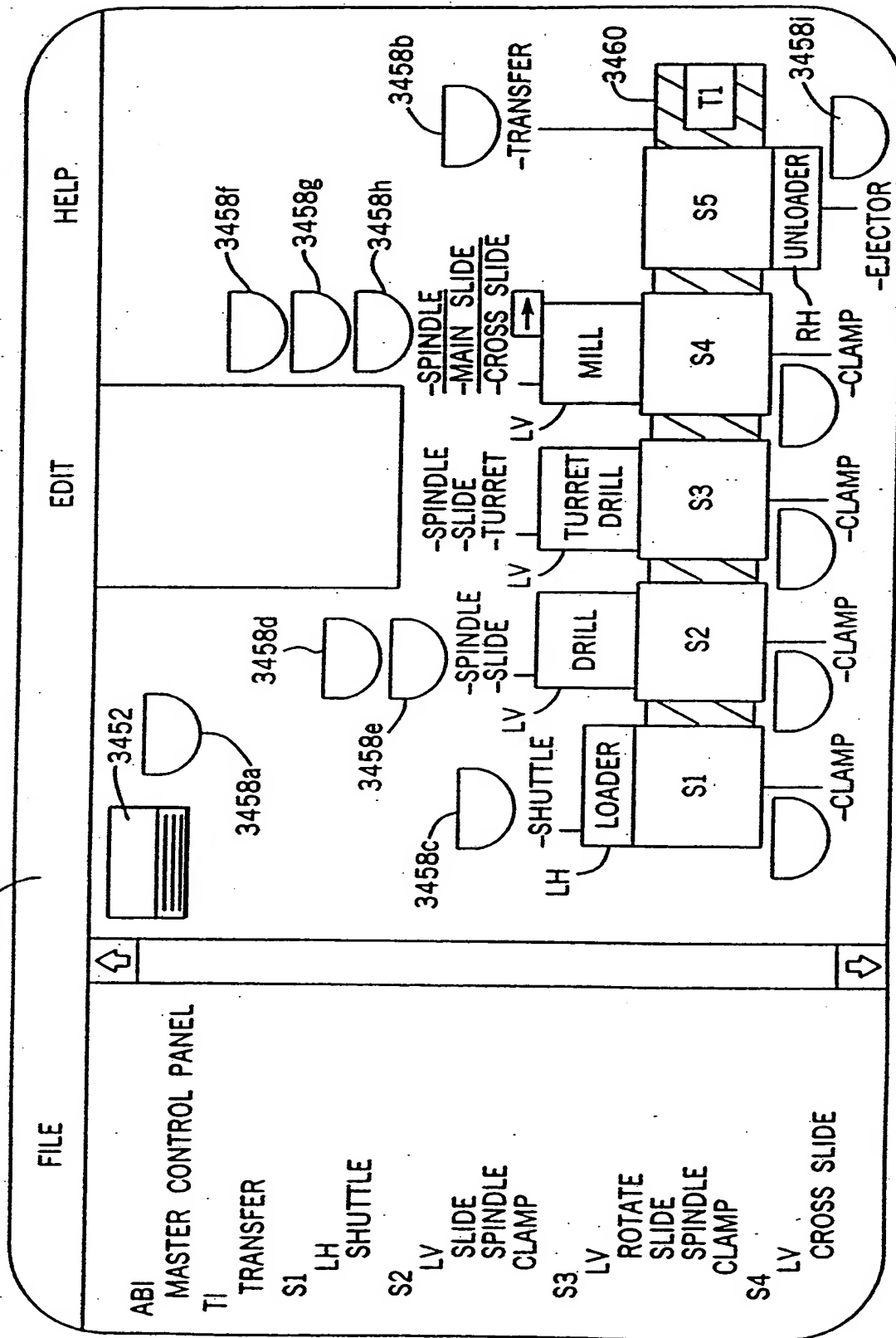
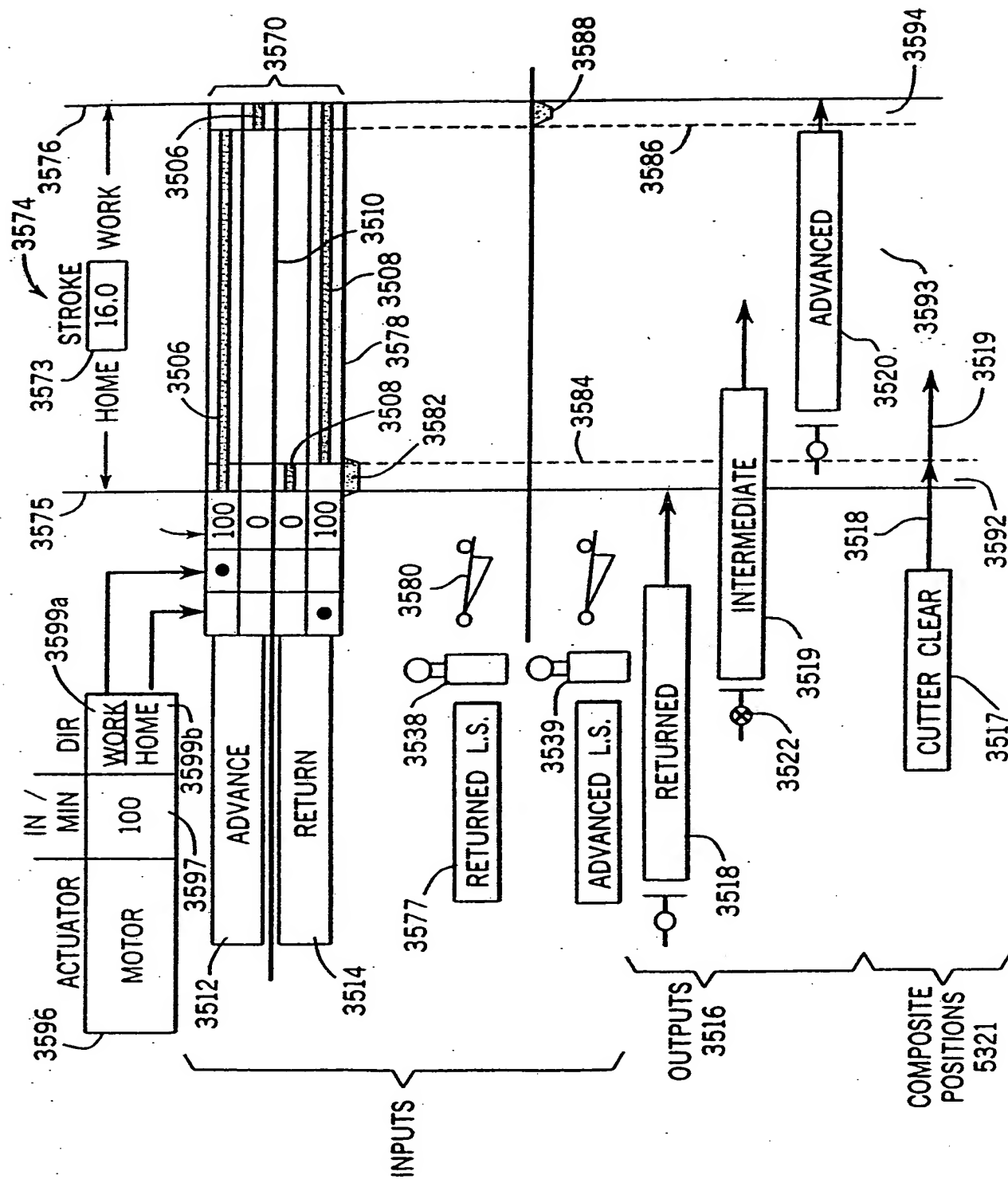


FIG. 35



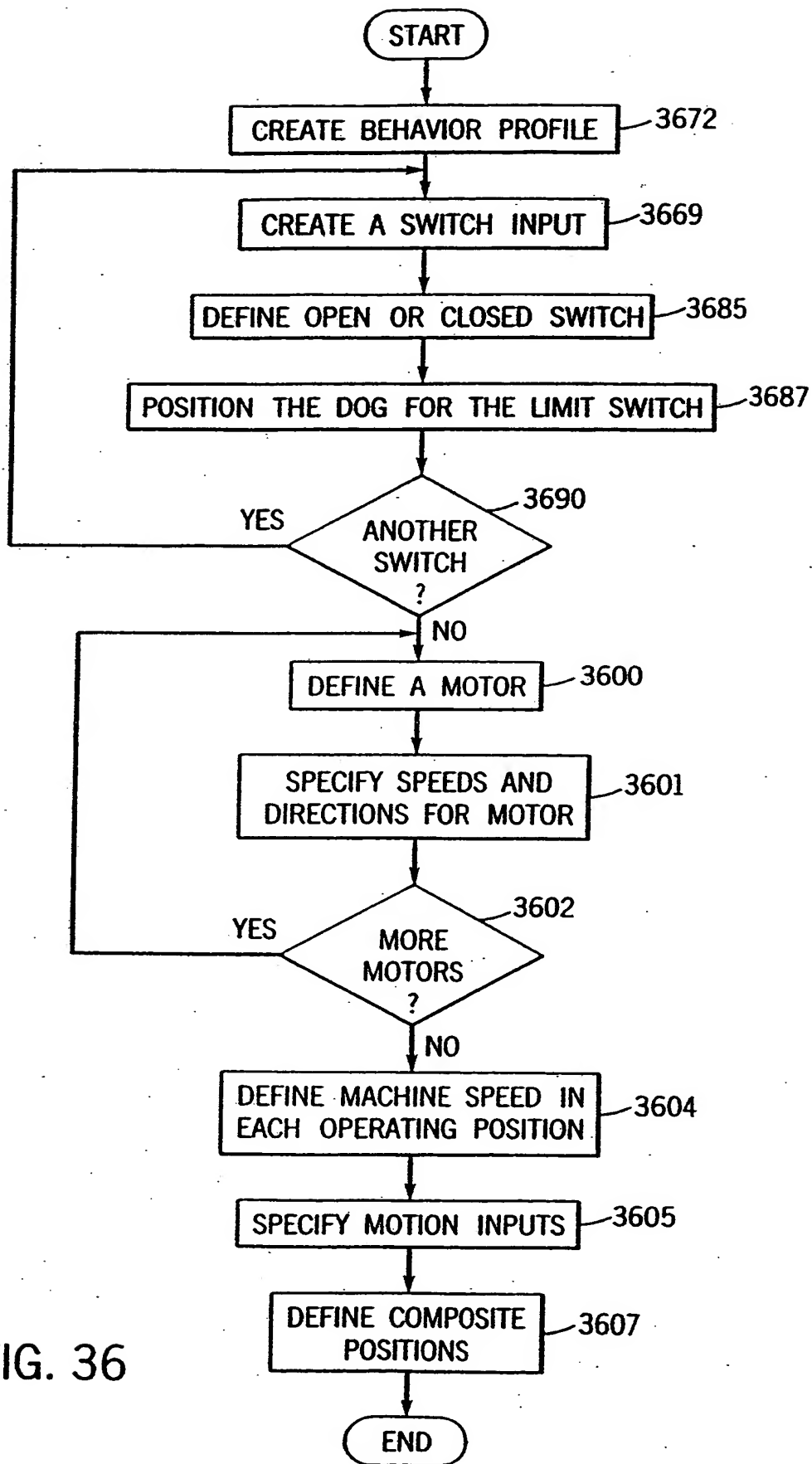


FIG. 36

FIG. 37

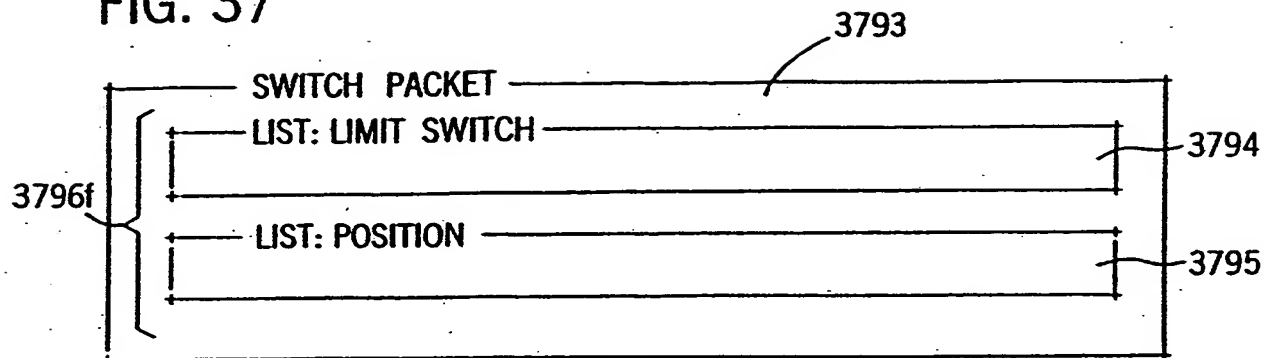


FIG. 38

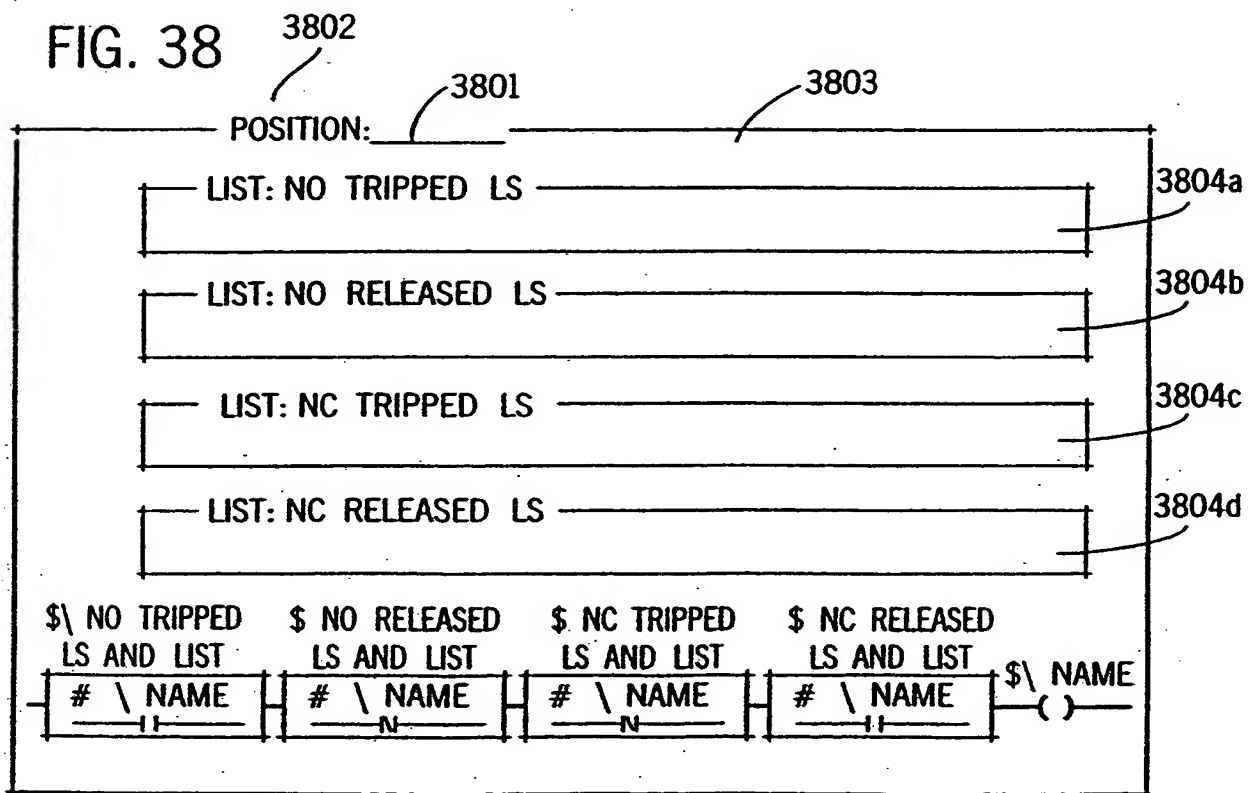


FIG. 39

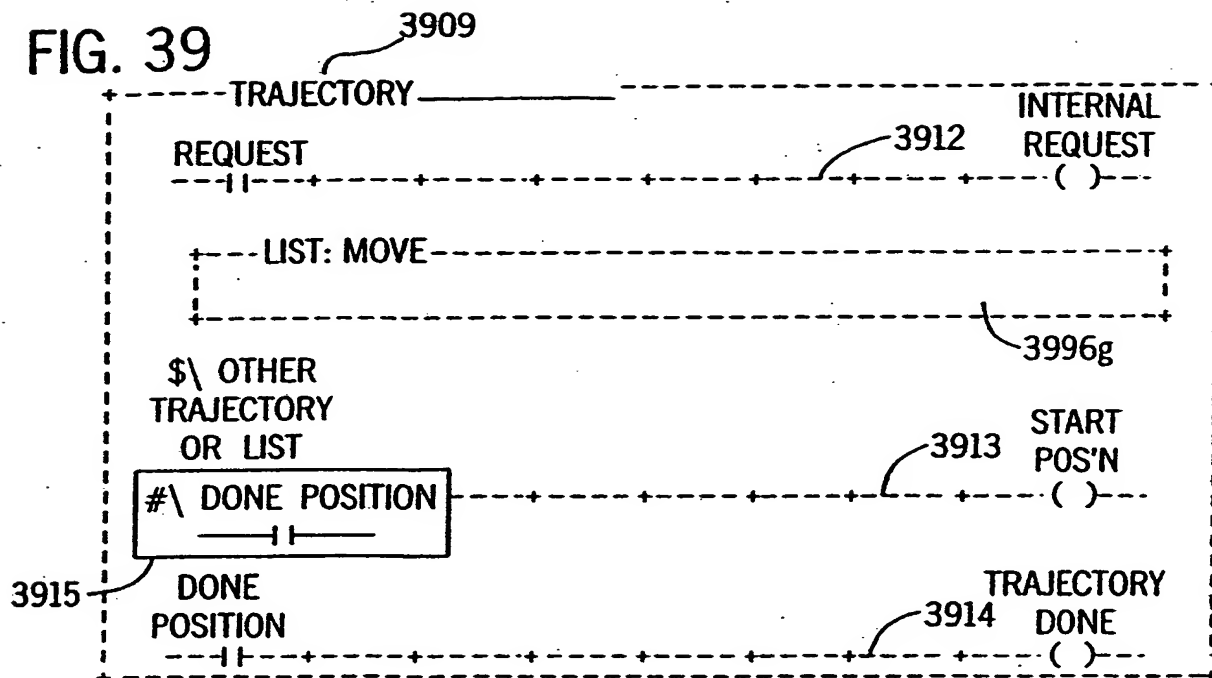


FIG. 40

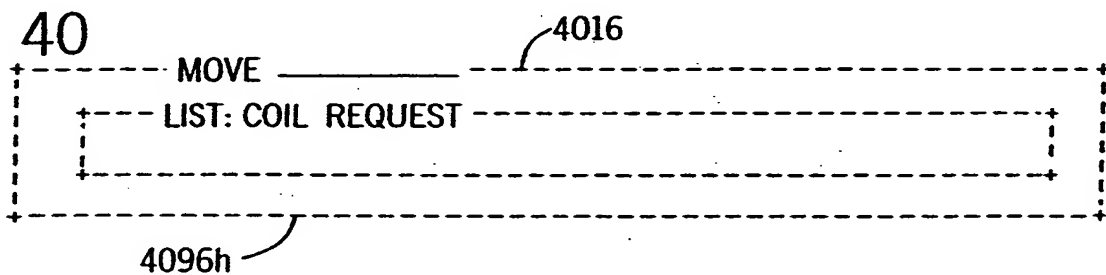


FIG. 41

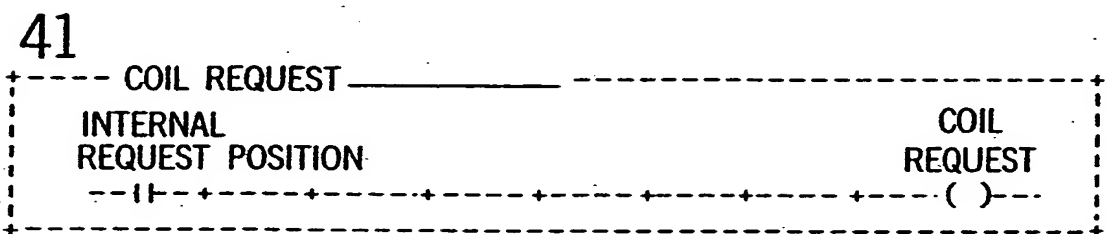


FIG. 42

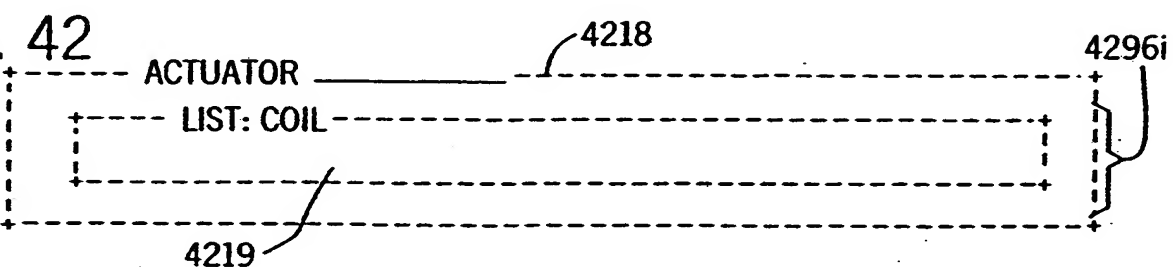


FIG. 43

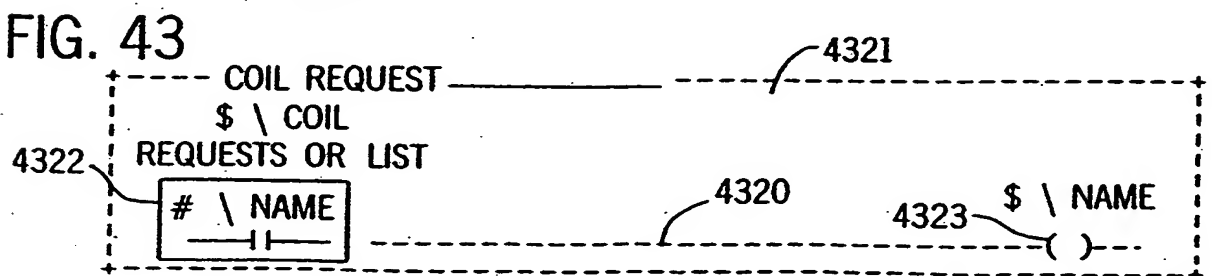


FIG. 44

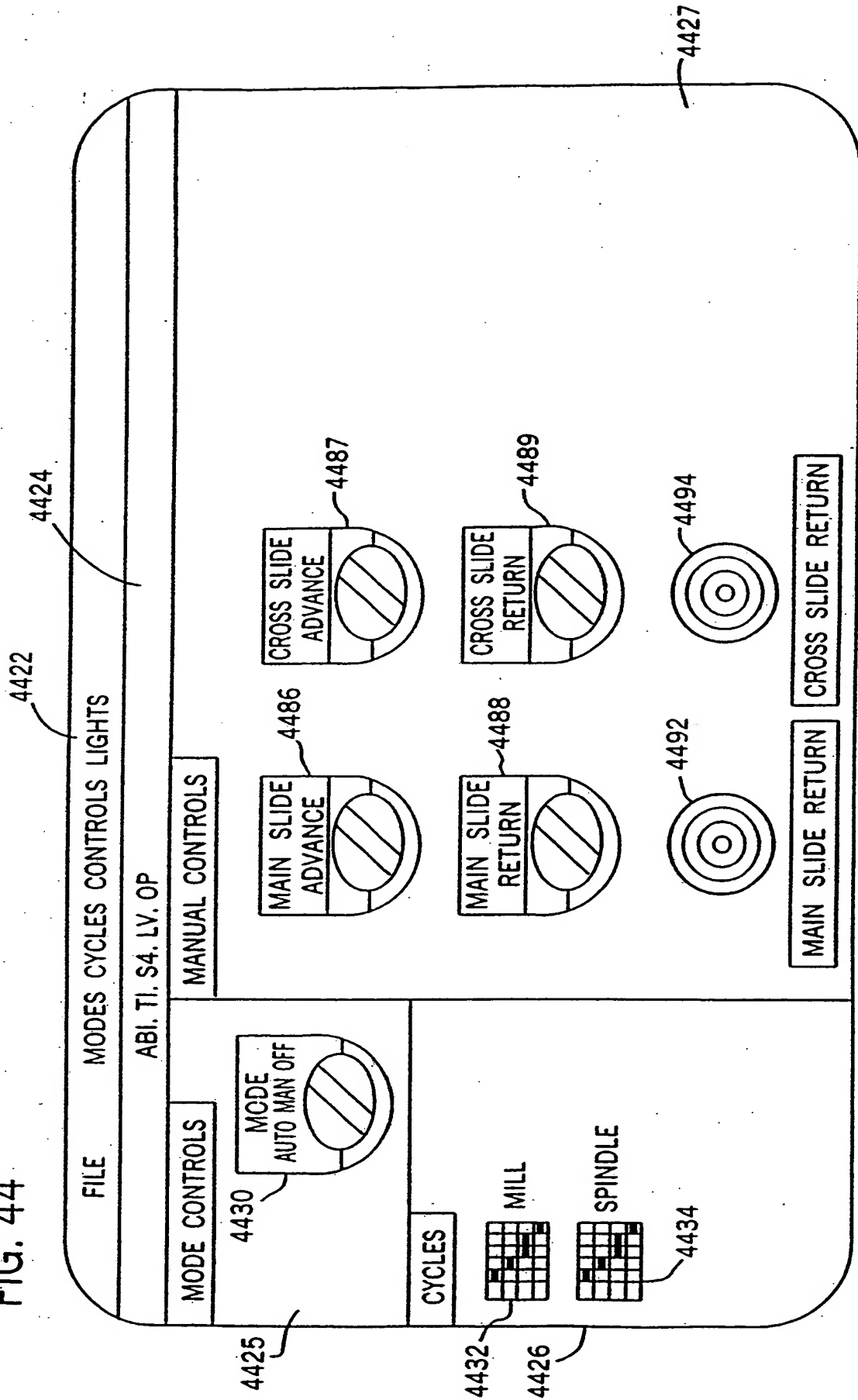




FIG. 45

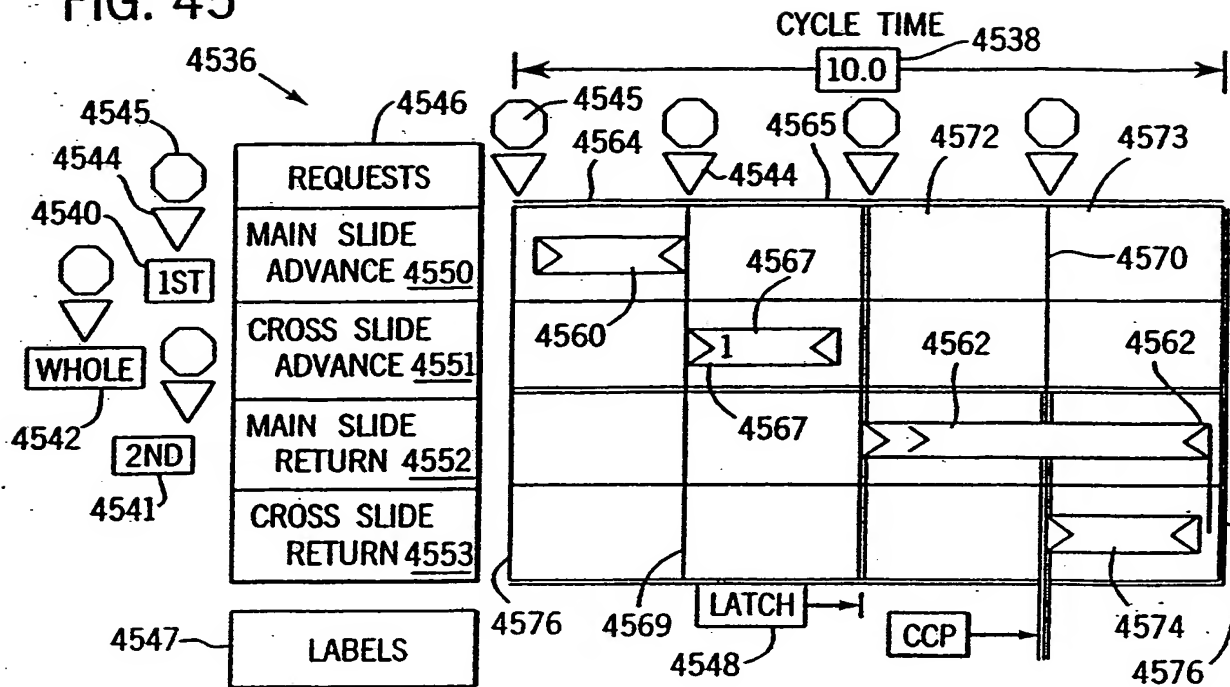


FIG. 46

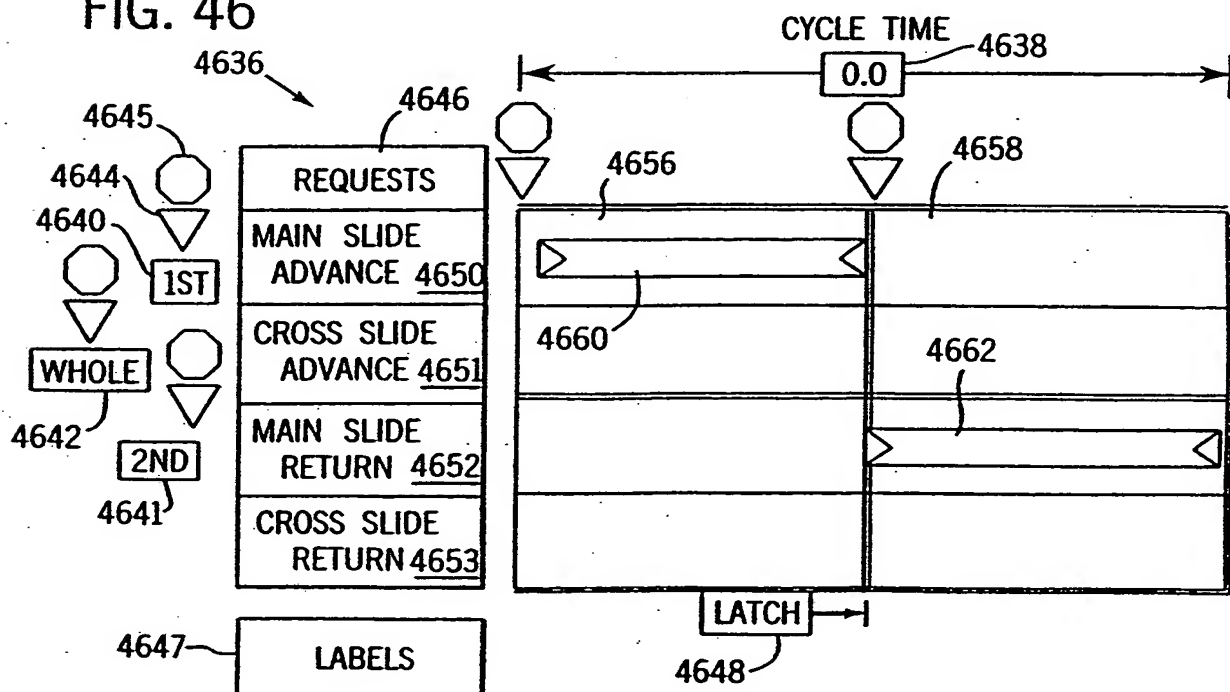
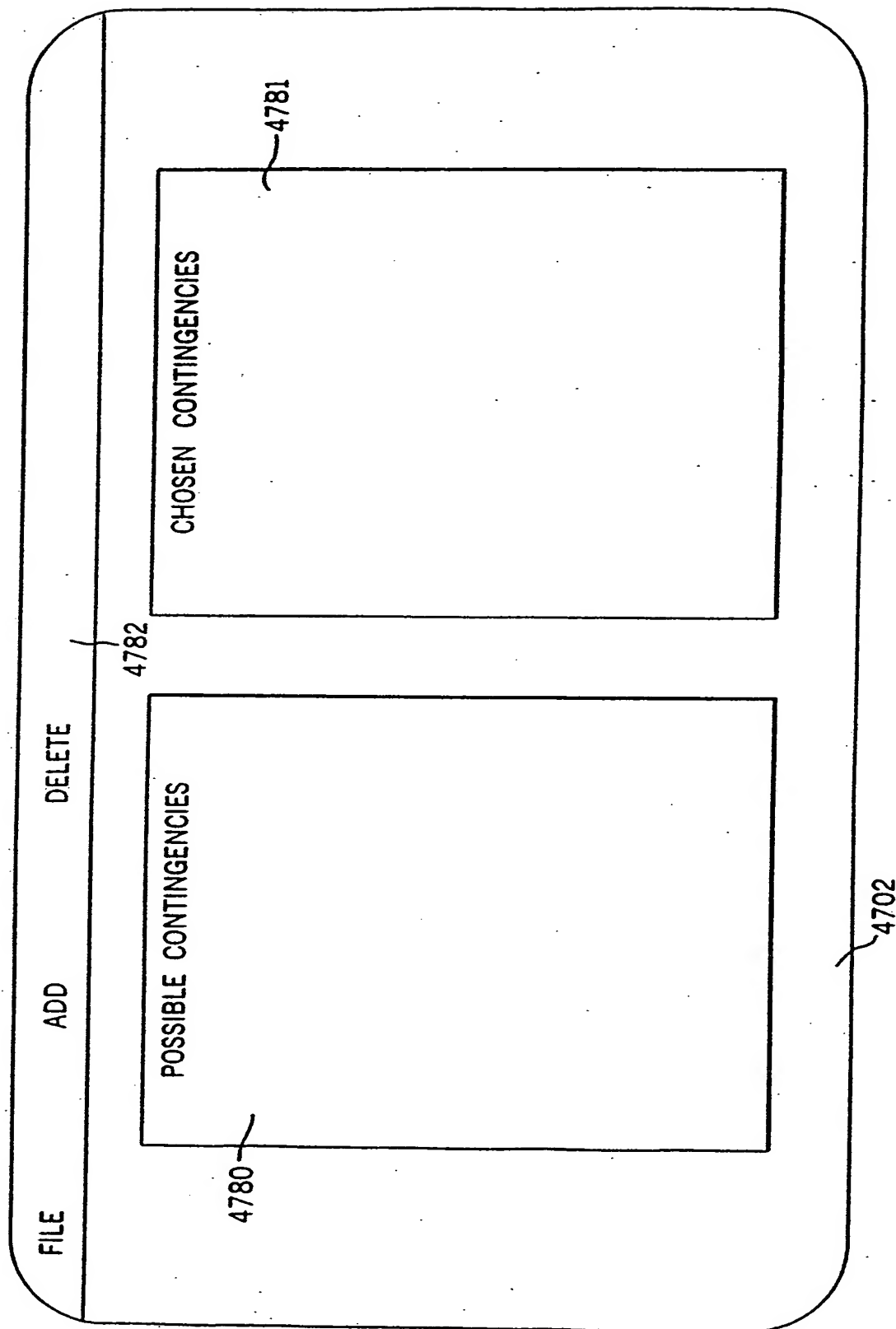


FIG. 47



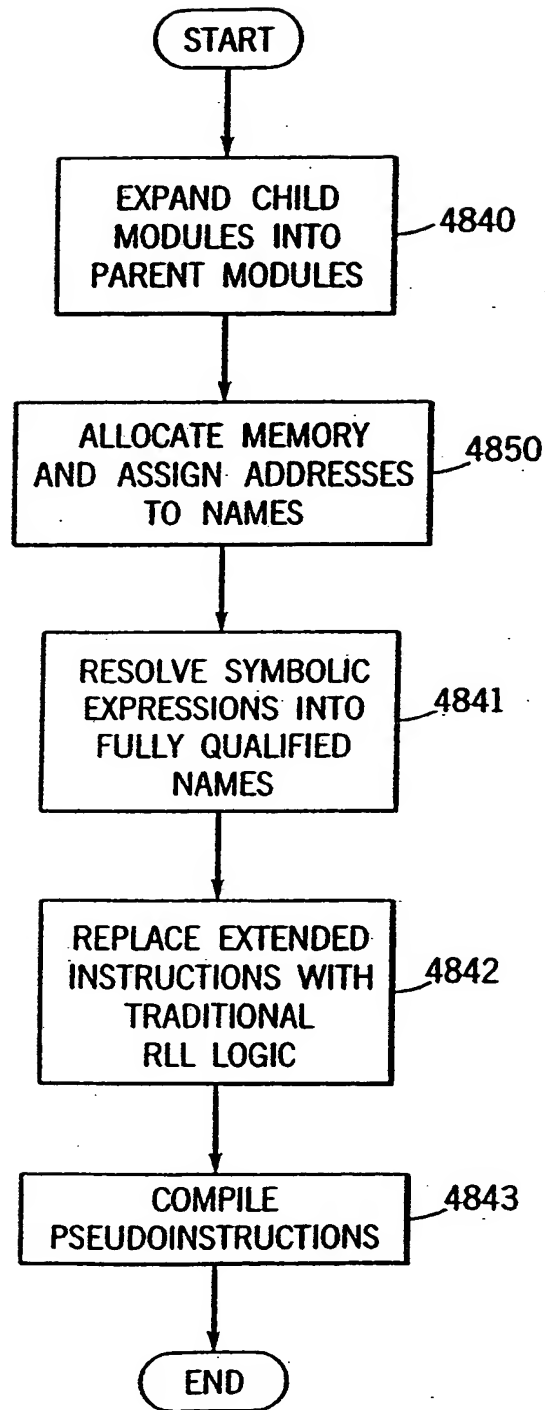
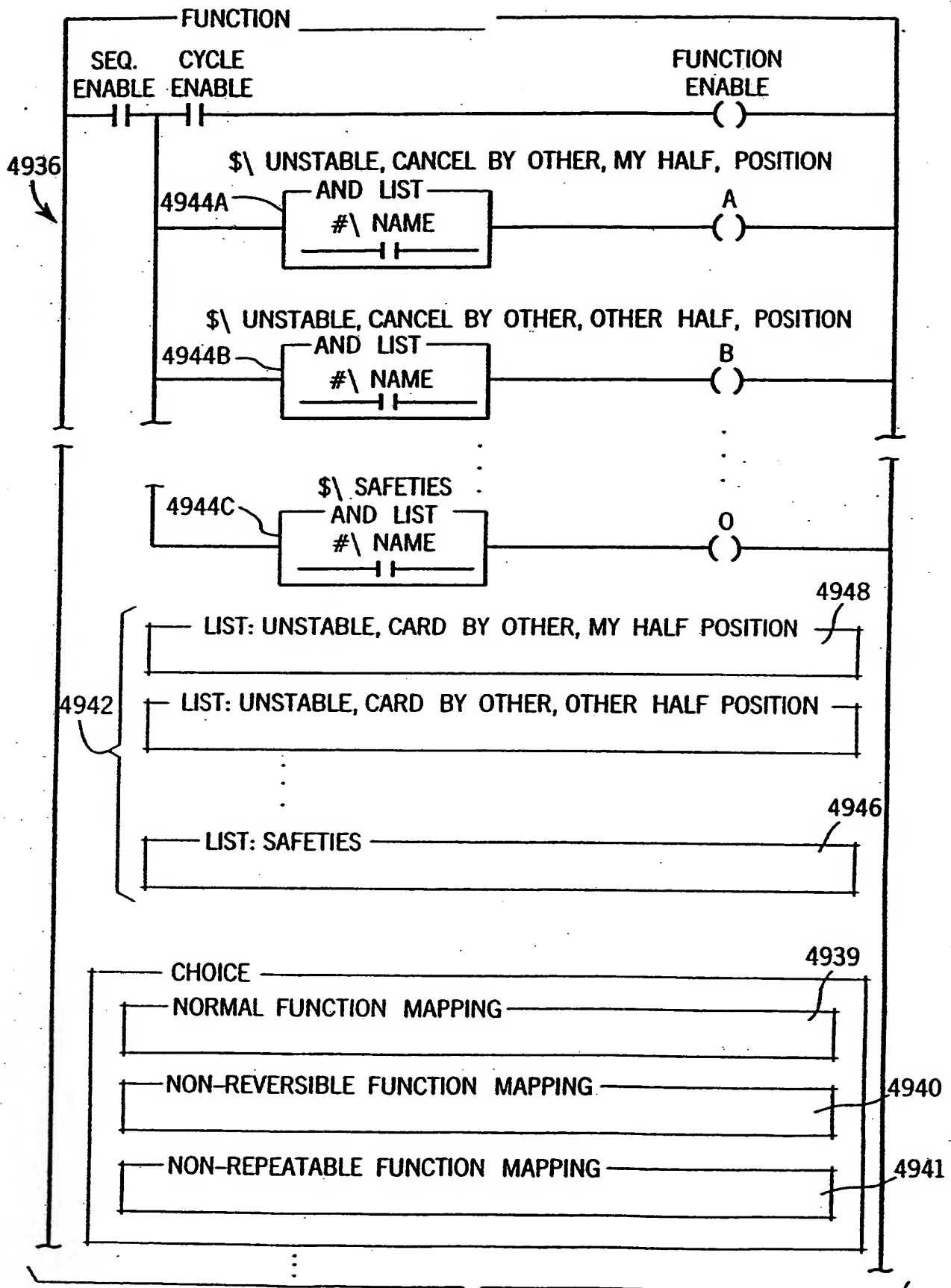


FIG. 48



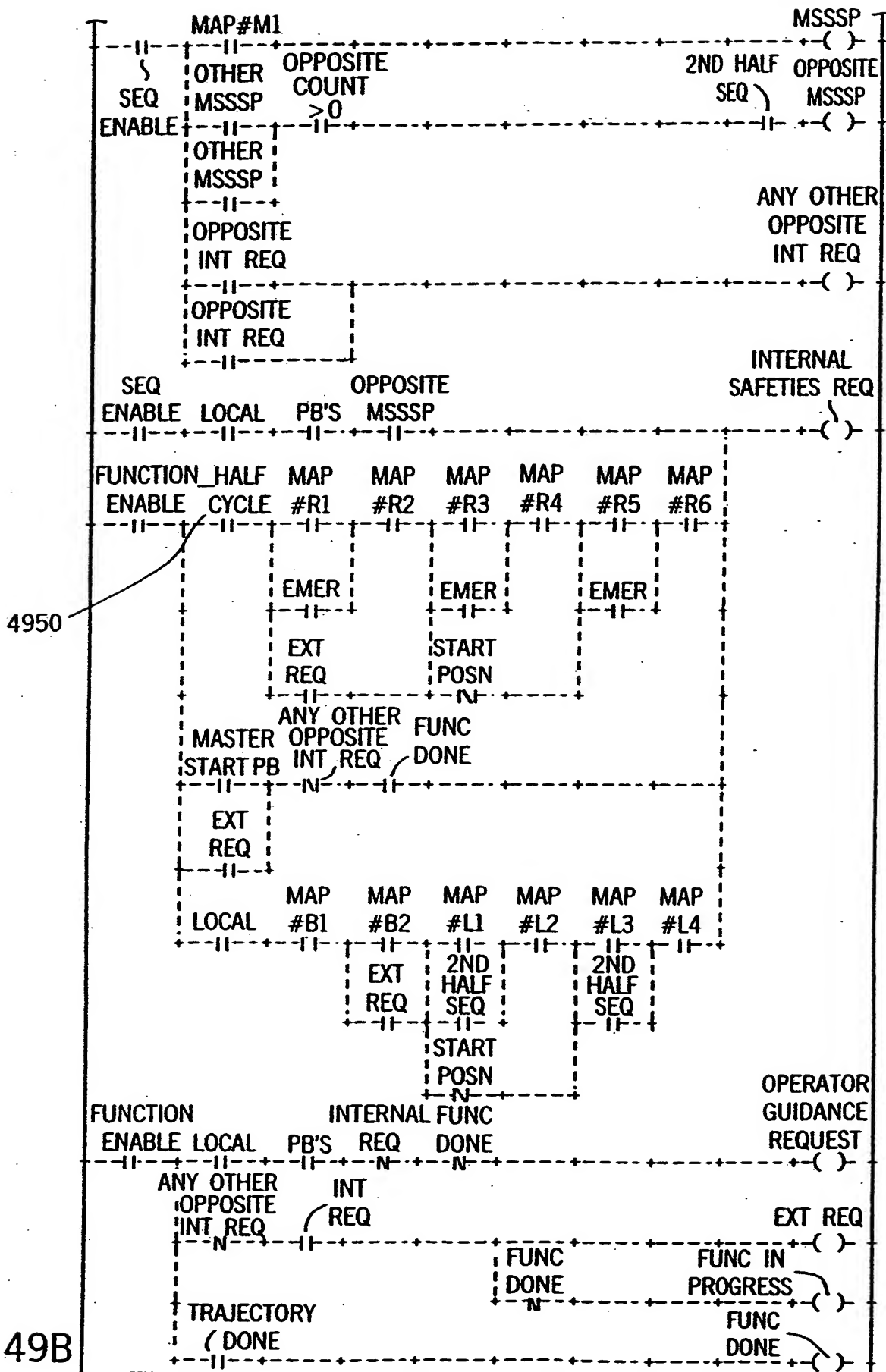


FIG. 49B

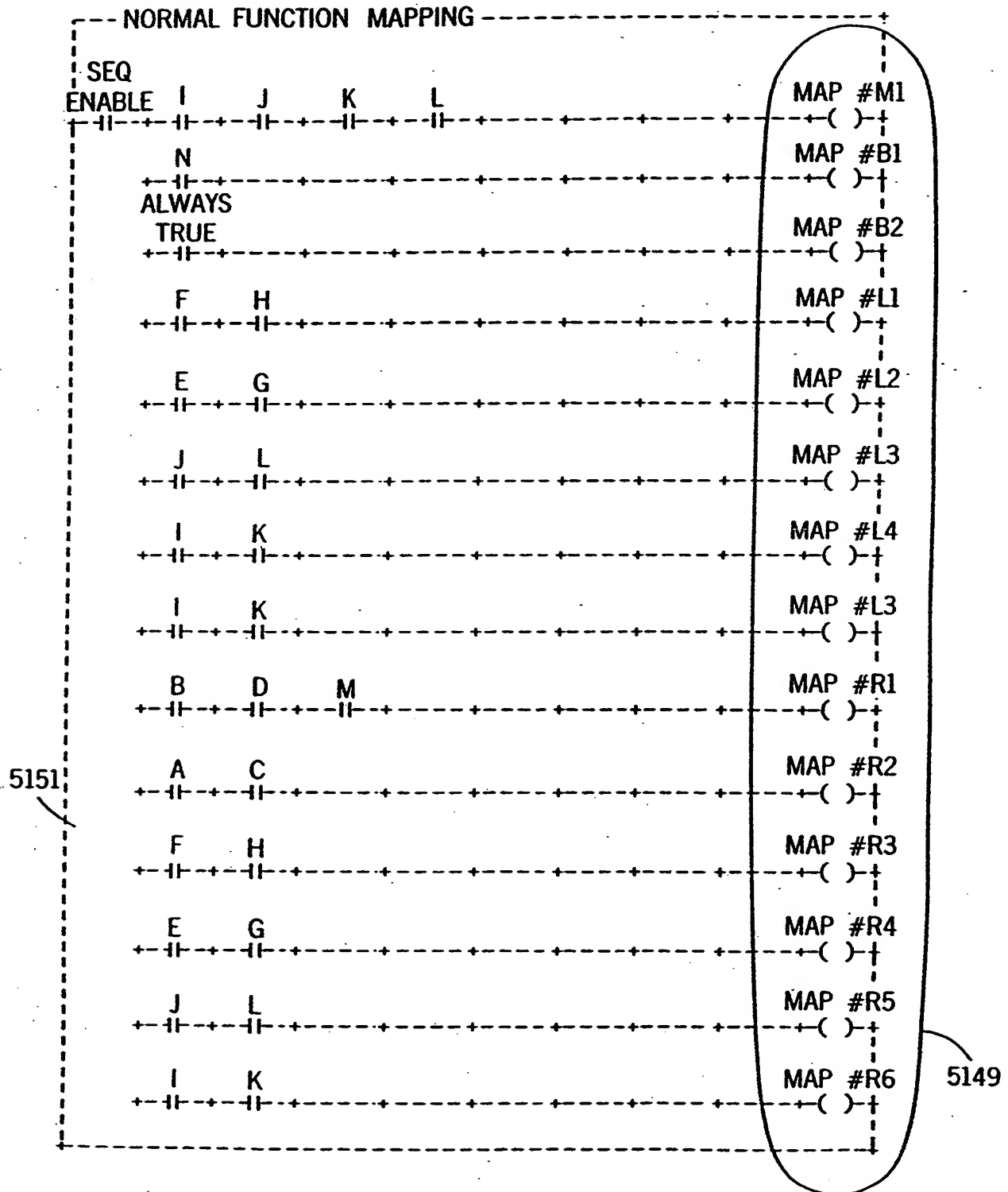
5032

ATTRIBUTES	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
STABLE									X	X	X	X			
UNSTABLE	X	X	X	X	X	X	X	X							
CANC BY OTHER	X	X	X	X											
CANC BY ME					X	X	X	X							
MY HALF OF CYC	X		X		X	X	X	X	X	X	X				
OTHER HALF		X		X		X		X		X		X			
POSITION	X	X			X	X		X	X	X					
LATCH			X	X			X	X		X	X	X			
MY START POS													X		
PUSH BUTTON														X	
SAFETY															X

5031

FIG. 50

FIG. 51



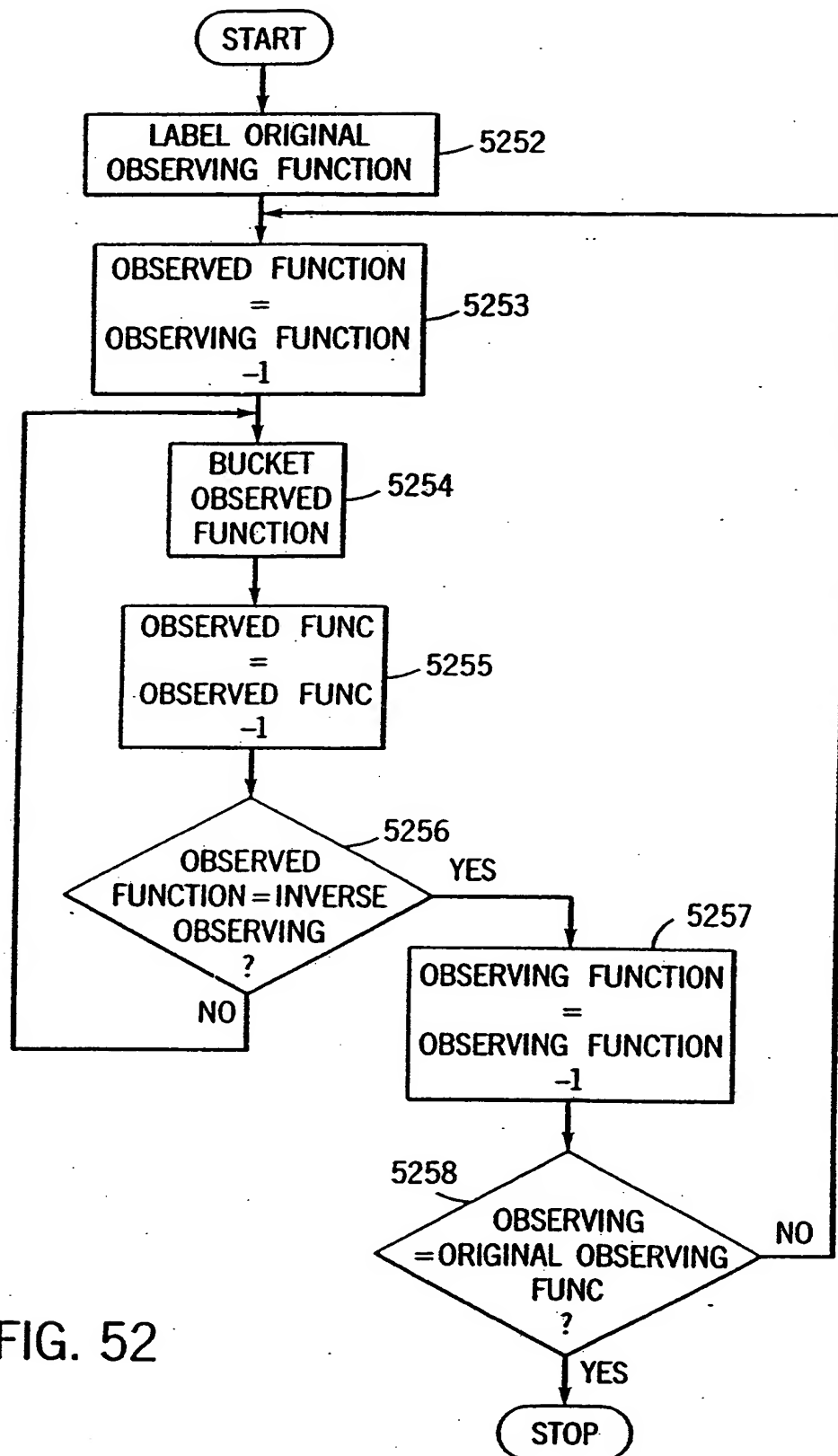
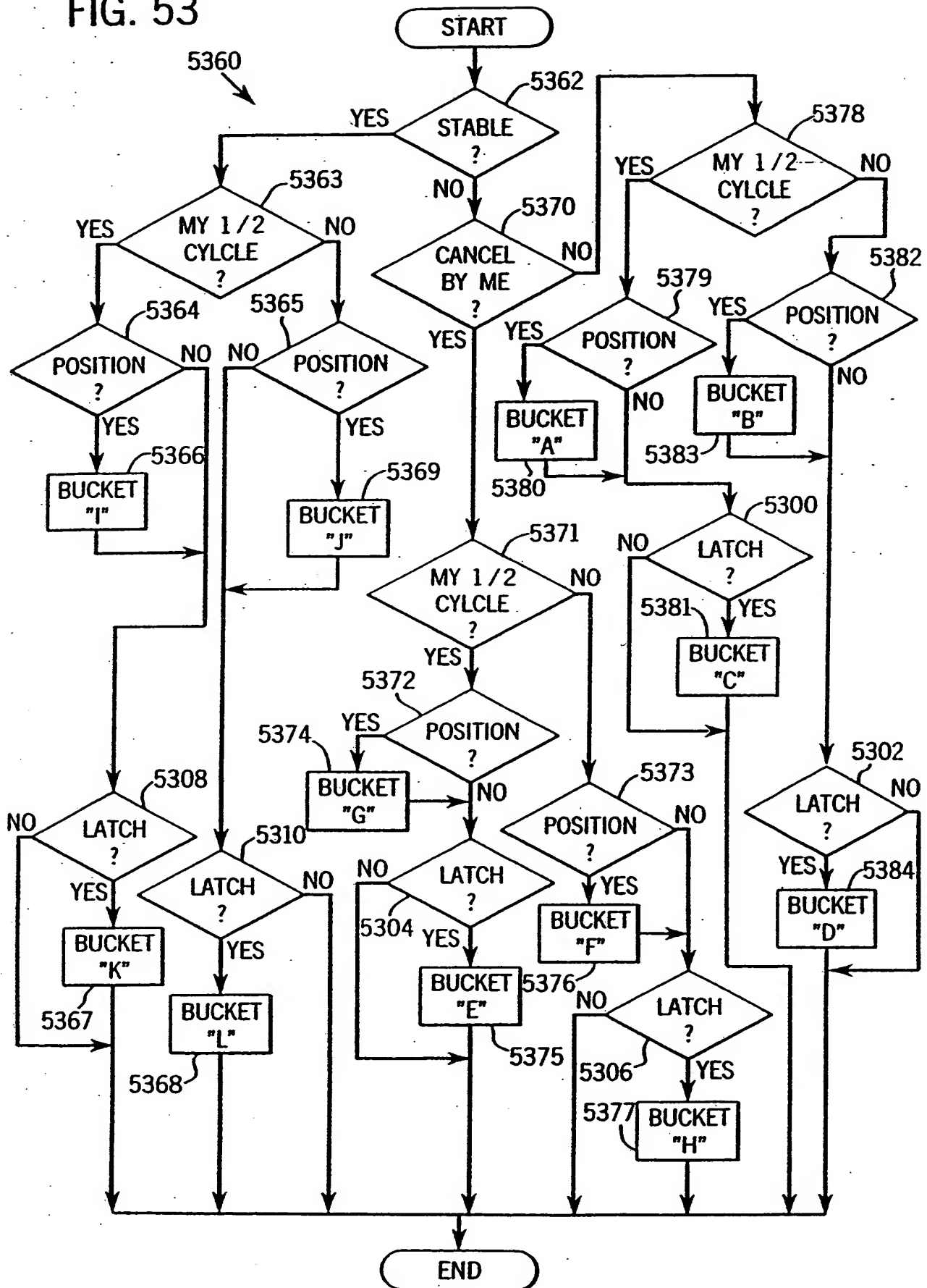


FIG. 52



FIG. 53



Enterprise Controls<sup>TM</sup>  
Designer Studio

This computer program is protected by  
U.S. and International copyright laws as  
described in Help About

Copyright © 1998 Allen-Bradley Company

FIG. 54

FIG. 55

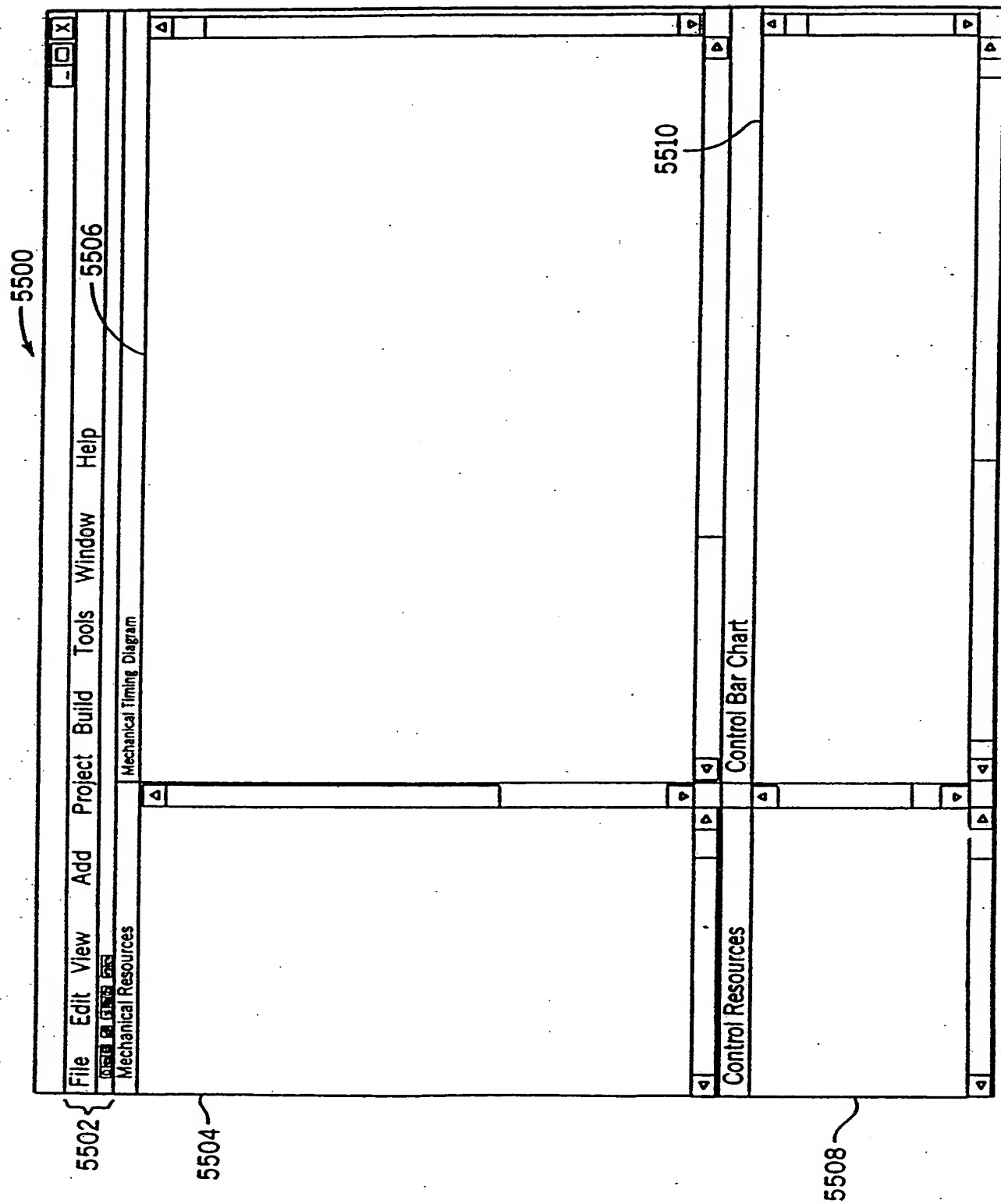


FIG. 56

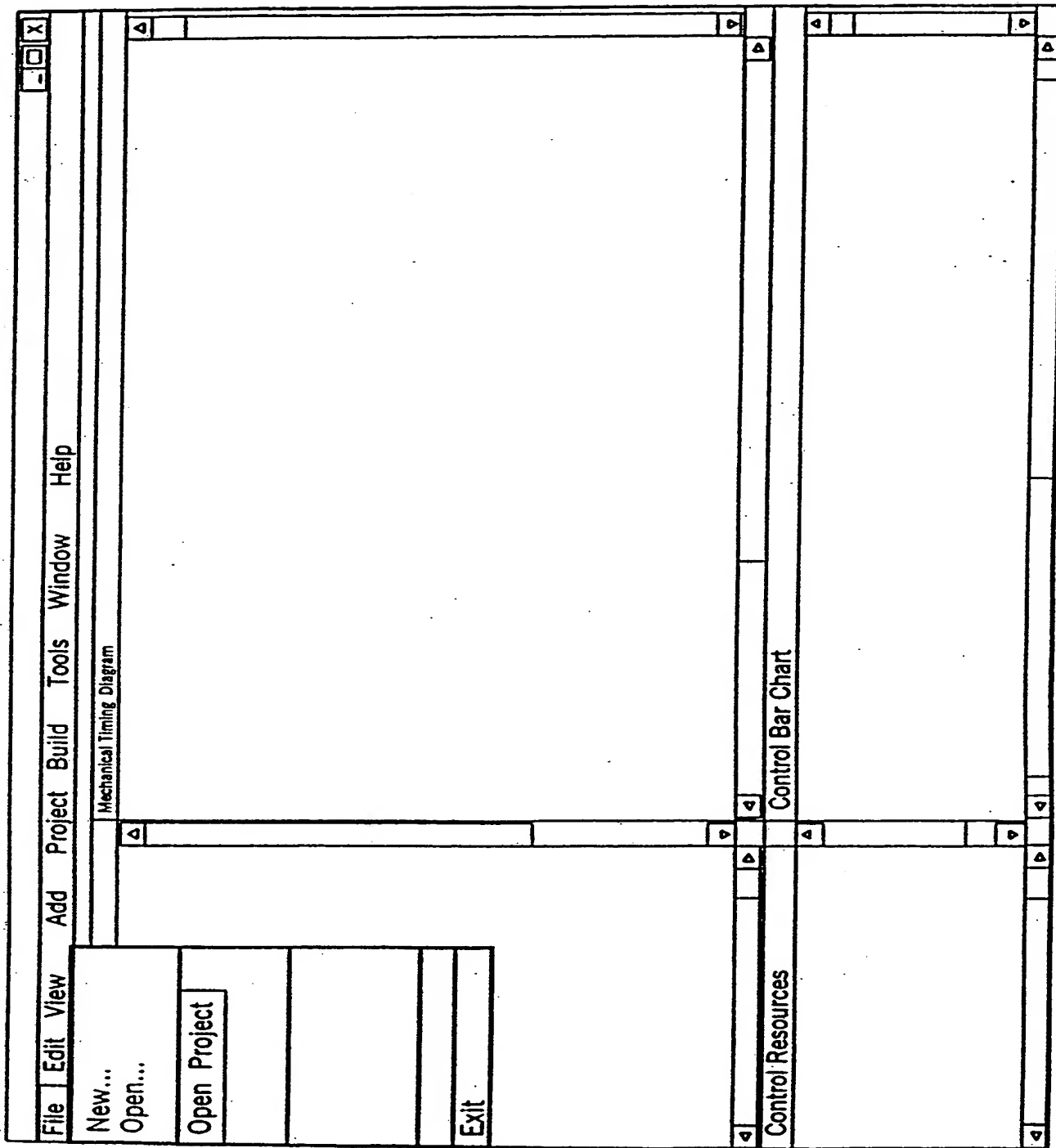
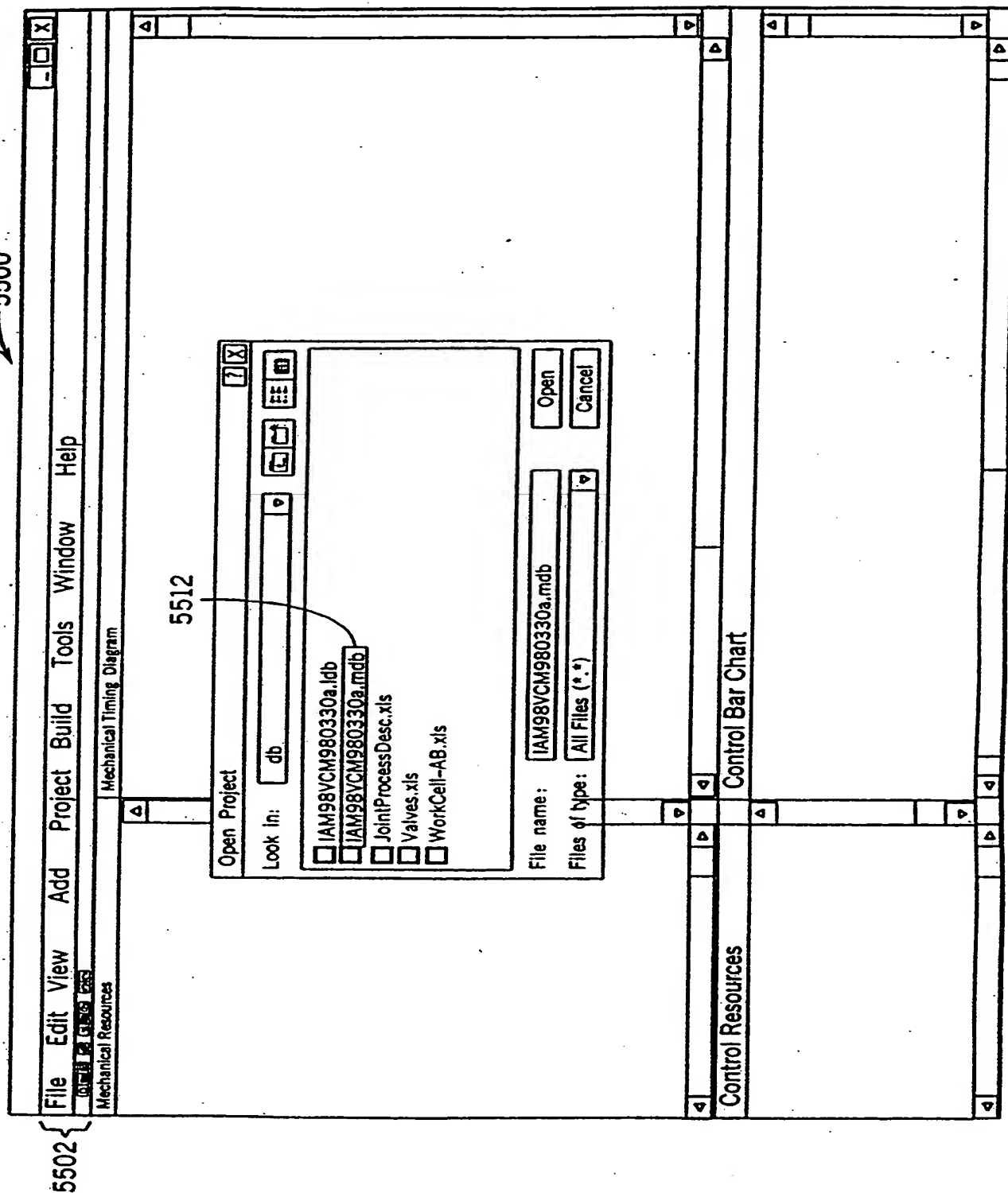


FIG. 57

5500



The screenshot displays the 'Mechanical Timing Diagram' software interface. The main window shows a Gantt chart for 'IAM98 Workcell Timing Diagram'. The chart is organized into columns representing different resources and their activities over a 92.0-second cycle time. The resources listed include Pin 2504A, Pin 5502A, Pin 5506A, Robot Gripper, Dump, Clamp 2506A, Clamp 4502A, Clamp 5508B, Clamp 5509A, Clamp 5516A, Clamp 2507A, Clamp 3514A, Clamp 3514B, Pin 5507A, Locator 5501A, Locator 5503AR, Operator Loader, Clamp 5505A, Clamp 5514AR, Clamp 5501BR, Clamp 5503BR, Pin 2504A, Pin 5502AR, Pin 5507A, Pin 5506A, and Locator 5501AR. The activities shown are Fixture, Load, Weld, and Un-Fixture. The interface includes a menu bar (File, Edit, View, Add, Project, Build, Tools, Window, Help) and a toolbar. The bottom status bar shows 'Control Bar Chart 5530' and 'IAM98 Workcell Bar Chart 5522'.

5508

FIG. 59

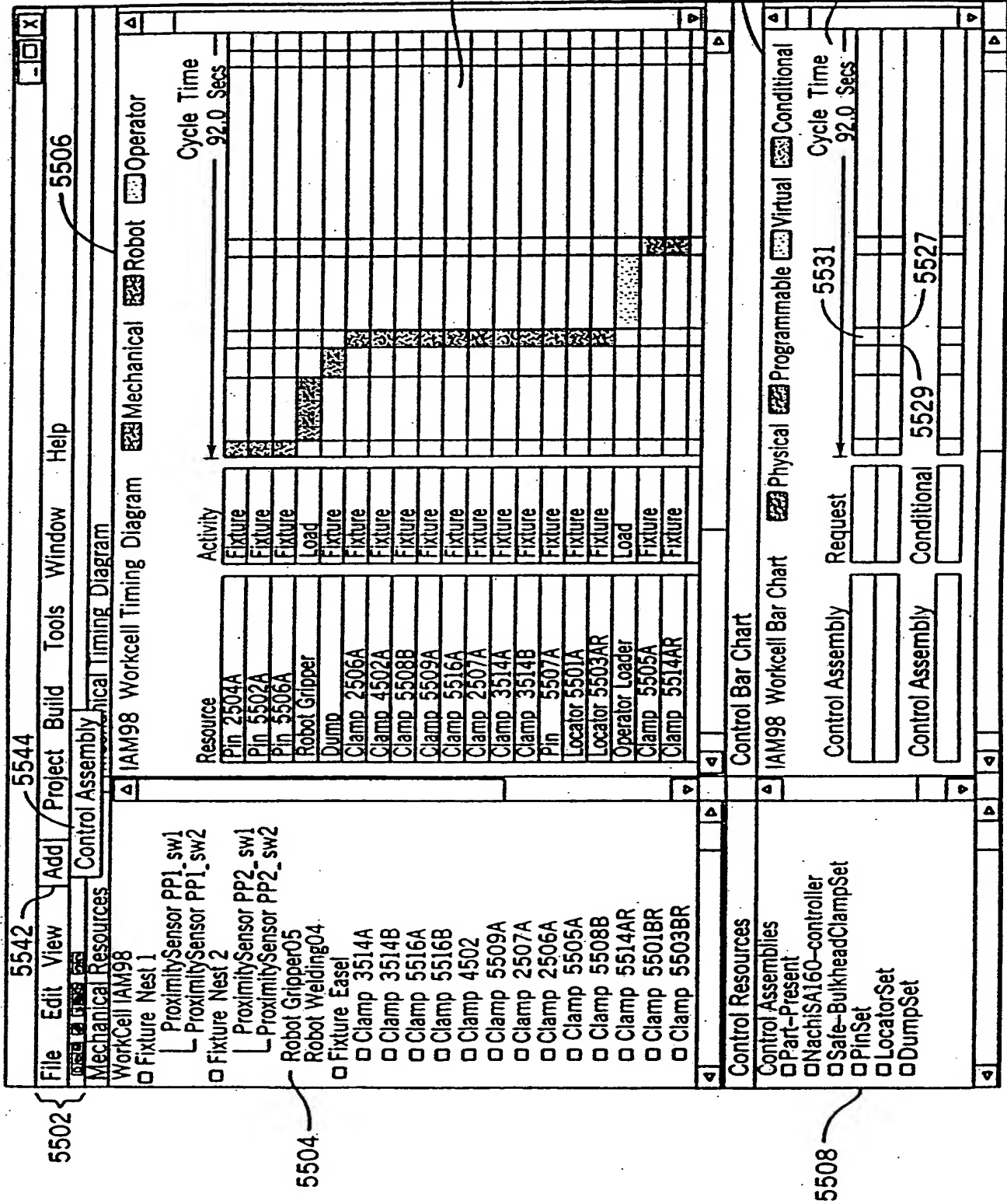


FIG. 60

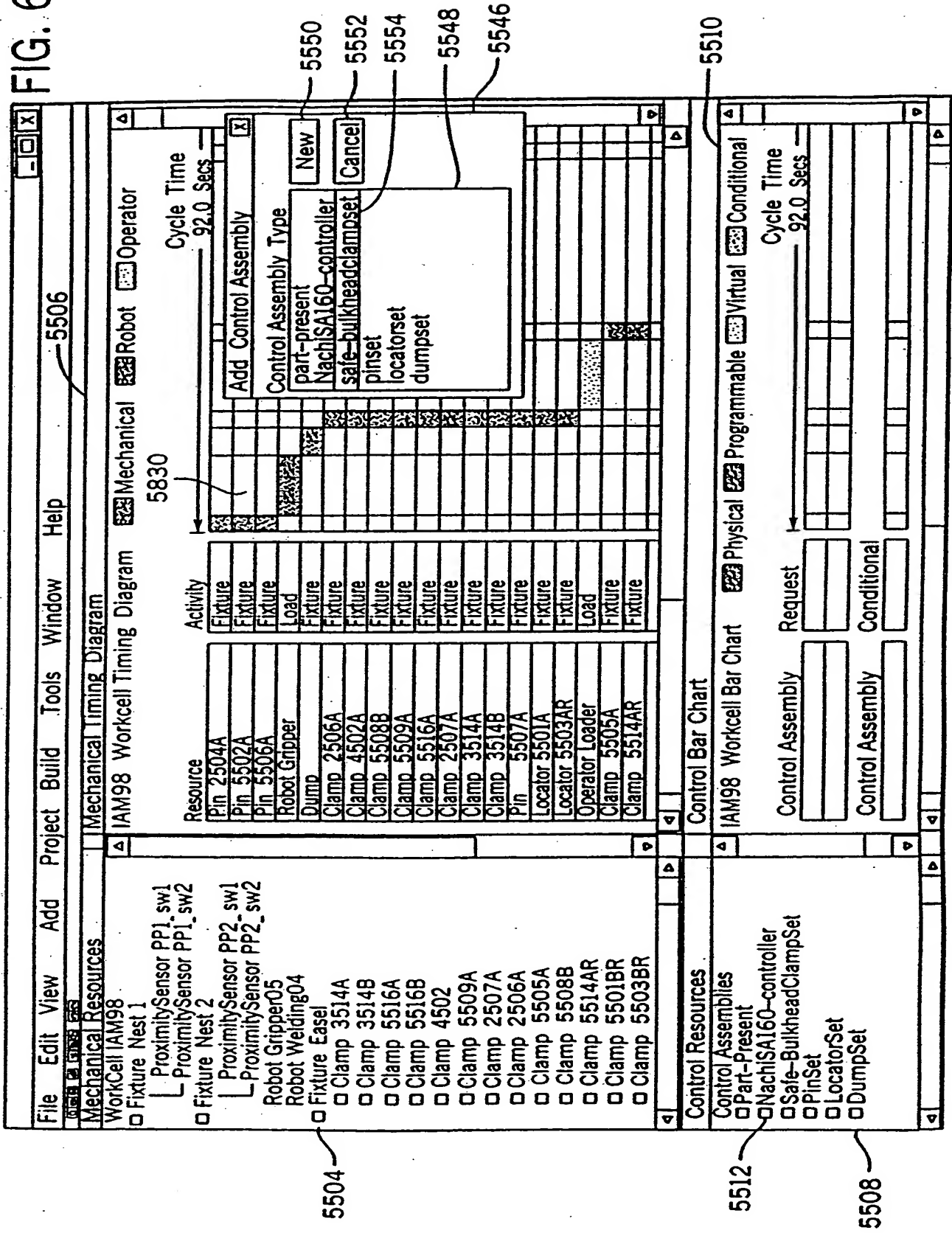




FIG. 61

File Edit View Add Project Build Tools Window Help

Mechanical Resources

WorkCell IAM98

☐ Fixture Nest 1

☐ ProximitySensor PP1\_sw1

☐ ProximitySensor PP1\_sw2

☐ Fixture Nest 2

☐ ProximitySensor PP2\_sw1

☐ ProximitySensor PP2\_sw2

Robot Gripper05

Robot Welding04

☐ Fixture Easel

☐ Clamp 3514A

☐ Clamp 3514B

☐ Clamp 5516A

☐ Clamp 5516B

☐ Clamp 4502

☐ Clamp 5509A

☐ Clamp 2507A

☐ Clamp 2506A

☐ Clamp 5505A

☐ Clamp 5508B

☐ Clamp 5514AR

☐ Clamp 5501BR

☐ Clamp 5503BR

Mechanical Timing Diagram

IAM98 Workcell Timing Diagram

☐ Robot ☐ Operator

Resource

Pin 2504A
Pin 5502A
Pin 5506A
Robot Gripper
Dump
Clamp 2506A
Clamp 4502A
Clamp 5508B
Clamp 5509A
Clamp 5516A
Clamp 2507A
Clamp 3514A
Clamp 3514B
Pin 5507A
Locator 5501A
Locator 5503AR
Operator Loader
Clamp 5505A
Clamp 5514AR

Activity

Fixture
Fixture
Fixture
Load
Fixture
Fixture
Fixture
Fixture
Fixture
Fixture
Fixture
Fixture

Add Control Assembly

Control Assembly Type

part-present

NachiSA160-controller

safe-bulkheadclampset

pinset

locatorset

dumpset

New Cancel

Control Resources

Control Assemblies

☐ Part-Present

☐ NachiSA160-controller

☐ Safe-BulkheadClampSet

☐ PinSet

☐ LocatorSet

☐ DumpSet

Control Bar Chart

IAM98 Workcell Bar Cha

Control Assembly

Control Assembly

Control Assembly Wizard - Step 1

Welcome to the Control Assembly (TM) Wizard!

The Wizard will create a new Control Assembly (TM) based on the parameters that you enter.

You must specify a name for the new Control Assembly (TM), the resources that the assembly will control, and for control components in the assembly that have a variable number you must specify the number.

Several parameters are set to defaults that will automatically generate all the diagnostics available for the assembly, a schematic of the assembly, and documentation for the assembly.

Back Next Finish Cancel

5504

5508

5550

5556

5510

5558

FIG. 62

File Edit View Add Project Build Tools Window Help	
Mechanical Resources	
WorkCell IAM98	
<input type="checkbox"/> Fixture Nest 1	
<input type="checkbox"/> ProximitySensor PP1_sw1	
<input type="checkbox"/> ProximitySensor PP1_sw2	
<input type="checkbox"/> Fixture Nest 2	
<input type="checkbox"/> ProximitySensor PP2_sw1	
<input type="checkbox"/> ProximitySensor PP2_sw2	
Robot Gripper05	
Robot Welding04	
<input type="checkbox"/> Fixture Easel	
<input type="checkbox"/> Clamp 3514A	
<input type="checkbox"/> Clamp 3514B	
<input type="checkbox"/> Clamp 5516A	
<input type="checkbox"/> Clamp 5516B	
<input type="checkbox"/> Clamp 4502	
<input type="checkbox"/> Clamp 5509A	
<input type="checkbox"/> Clamp 2507A	
<input type="checkbox"/> Clamp 2506A	
<input type="checkbox"/> Clamp 5505A	
<input type="checkbox"/> Clamp 5508B	
<input type="checkbox"/> Clamp 5514AR	
<input type="checkbox"/> Clamp 5501BR	
<input type="checkbox"/> Clamp 5503BR	

Mechanical Timing Diagram	
<b>IAM98 Workcell Timing Diagram</b> Mechanical     Robot     Operator	
Resource	Activity
Pin 2504A	Fixture
Pin 5502A	Fixture
Pin 5506A	Fixture
Robot Gripper	Load
Dump	Fixture
Clamp 2506A	Fixture
Clamp 4502A	Fixture
Clamp 5508B	Fixture
Clamp 5509A	Fixture
Clamp 5516A	Fixture
Clamp 2507A	Fixture
Clamp 3514A	Fixture
Clamp 3514B	Fixture
Pin 5507A	Fixture
Locator 5501A	
Locator 5503AR	
Operator Loader	
Clamp 5505A	
Clamp 5514AR	

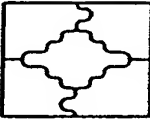
  

Control Resources.	
Control Assemblies	
<input type="checkbox"/> Part-Present	
<input type="checkbox"/> NachiSA160-controller	
<input type="checkbox"/> Safe-BulkheadClampSet	
<input type="checkbox"/> PinSet	
<input type="checkbox"/> LocatorSet	
<input type="checkbox"/> DumpSet	

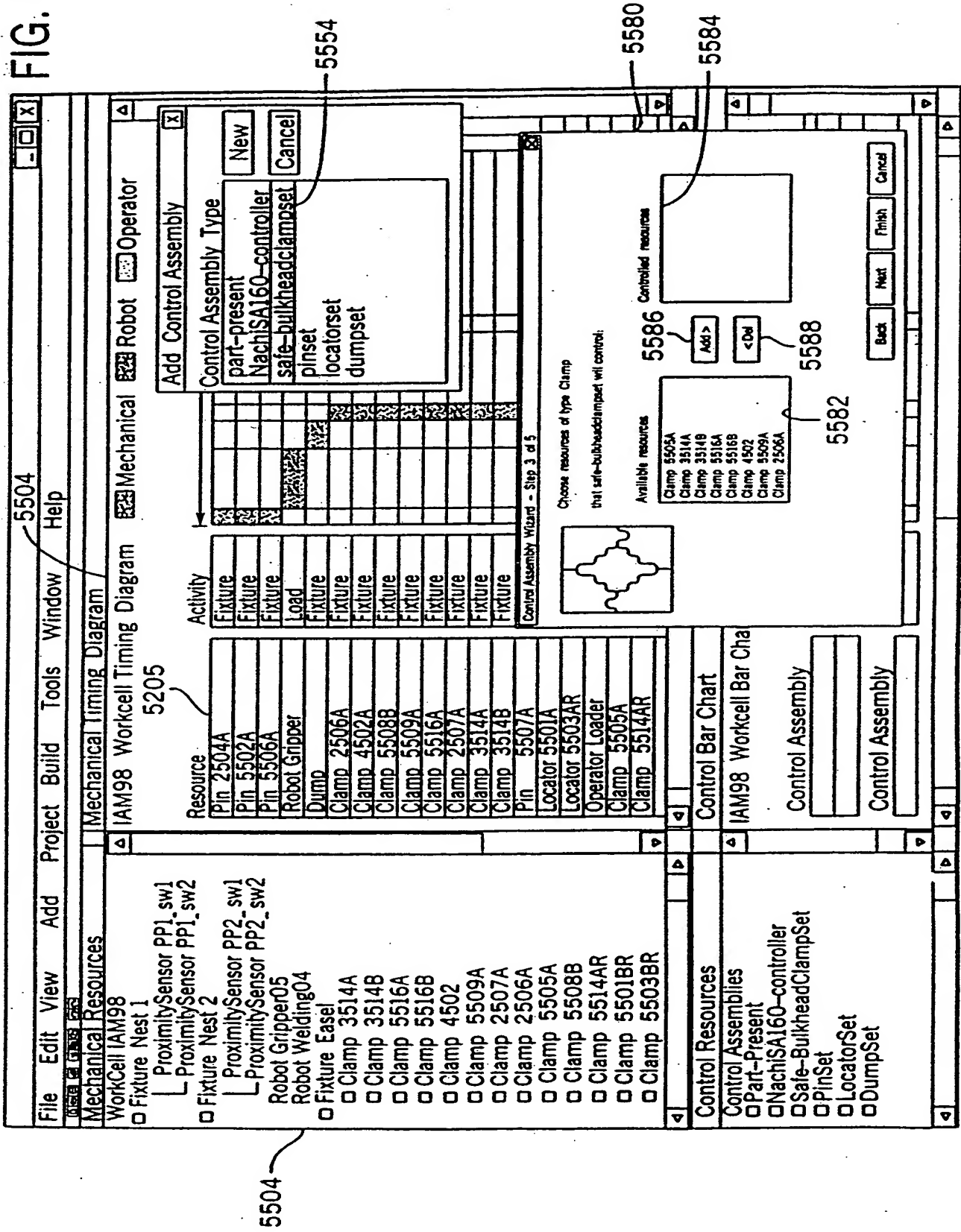
Control Bar Chart	
<b>IAM98 Workcell Bar Cha</b>	
Control Assembly	
Control Assembly	

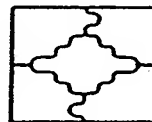
Control Assembly Wizard - Step 2 of 5	
 <p>Control Assembly Type: safe-bulkheadclampset</p> <p>Specify name for the new Control Assembly:</p> <div style="border: 1px solid black; width: 150px; height: 20px; margin-bottom: 5px;"></div> <p>5564</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>5556</p> <p>5568</p> <p>5570</p> <p>5572</p> <p>5574</p> <p>5558</p> </div> <p>5576</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Create HMI for the assembly</li> <li><input checked="" type="checkbox"/> Create Simulation tools for the assembly</li> <li><input checked="" type="checkbox"/> Create Wiring Diagram for the assembly</li> <li><input checked="" type="checkbox"/> Create all available Diagnostics for the assembly</li> <li><input checked="" type="checkbox"/> Create Documentation for the assembly</li> </ul> <div style="text-align: right;"> <span>Back</span> <span>Next</span> <span>Finish</span> <span>Cancel</span> </div>

File Edit View Add Project Build Tools Window Help					
<b>Mechanical Resources</b>					
WorkCell IAM98					
<input type="checkbox"/> Fixture Nest 1					
<input type="checkbox"/> ProximitySensor PP1_sw1					
<input type="checkbox"/> ProximitySensor PP1_sw2					
<input type="checkbox"/> Fixture Nest 2					
<input type="checkbox"/> ProximitySensor PP2_sw1					
<input type="checkbox"/> ProximitySensor PP2_sw2					
<input type="checkbox"/> Robot GripperO5					
<input type="checkbox"/> Robot WeldingO4					
<input type="checkbox"/> Fixture Easel					
<input type="checkbox"/> Clamp 3514A					
<input type="checkbox"/> Clamp 3514B					
<input type="checkbox"/> Clamp 5516A					
<input type="checkbox"/> Clamp 5516B					
<input type="checkbox"/> Clamp 4502					
<input type="checkbox"/> Clamp 5509A					
<input type="checkbox"/> Clamp 2507A					
<input type="checkbox"/> Clamp 2506A					
<input type="checkbox"/> Clamp 5505A					
<input type="checkbox"/> Clamp 5508B					
<input type="checkbox"/> Clamp 5514AR					
<input type="checkbox"/> Clamp 5501BR					
<input type="checkbox"/> Clamp 5503BR					
<b>Control Resources</b>					
<b>Control Assemblies</b>					
<input type="checkbox"/> Part-Present					
<input type="checkbox"/> NachiSAI60-controller					
<input type="checkbox"/> Safe-BulkheadClampSet					
<input type="checkbox"/> PinSet					
<input type="checkbox"/> LocatorSet					
<input type="checkbox"/> DumpSet					
<b>Mechanical Timing Diagram</b>					
IAM98 Workcell Timing Diagram					
Add Control Assembly					
Control Assembly Type					
part-present					
NachiSAI60-controller					
safe-bulkheadclampset					
pinset					
locatorset					
dumpset					
Control Assembly Wizard - Step 2 of 5					
Control Assembly Type:					
safe-bulkheadclampset					
Specify name for the new Control Assembly					
Intclamp   5578 5564					
Create Wiring Diagram for the Assembly					
Create all available Diagnostics for the assembly					
Create Documentation for the assembly					
Back Next Finish Cancel					
5558					
Control Bar Chart					
IAM98 Workcell Bar Cha					
Control Assembly					
Control Assembly					

FIG. 64



File	Edit View	Add	Project Build Tools Window Help																																								
<b>Mechanical Resources</b>																																											
WorkCell IAM98																																											
<input type="checkbox"/> Fixture Nest 1	<input type="checkbox"/> ProximitySensor PP1_sw1	<input type="checkbox"/> ProximitySensor PP1_sw2																																									
<input type="checkbox"/> Fixture Nest 2	<input type="checkbox"/> ProximitySensor PP2_sw1	<input type="checkbox"/> ProximitySensor PP2_sw2																																									
<input type="checkbox"/> Robot Gripper05	<input type="checkbox"/> Robot Welding04	<input type="checkbox"/> Fixture Easel																																									
<input type="checkbox"/> Clamp 3514A	<input type="checkbox"/> Clamp 3514B	<input type="checkbox"/> Clamp 5508B																																									
<input type="checkbox"/> Clamp 5516A	<input type="checkbox"/> Clamp 5516B	<input type="checkbox"/> Clamp 4502																																									
<input type="checkbox"/> Clamp 5509A	<input type="checkbox"/> Clamp 2507A	<input type="checkbox"/> Clamp 2506A																																									
<input type="checkbox"/> Clamp 2506A	<input type="checkbox"/> Clamp 5505A	<input type="checkbox"/> Clamp 5508B																																									
<input type="checkbox"/> Clamp 5514AR	<input type="checkbox"/> Clamp 5501BR	<input type="checkbox"/> Clamp 5503BR																																									
<input type="checkbox"/> Clamp 5503BR																																											
<b>Control Resources</b>																																											
<b>Control Assemblies</b>																																											
<input type="checkbox"/> Part-Present	<input type="checkbox"/> NachiSA160-controller	<input type="checkbox"/> Safe-BulkheadClampSet																																									
<input type="checkbox"/> PinSet	<input type="checkbox"/> LocatorSet	<input type="checkbox"/> DumpSet																																									
<b>Mechanical Timing Diagram</b>																																											
IAM98 Workcell Timing Diagram																																											
<table border="1"> <thead> <tr> <th>Resource</th> <th>Activity</th> </tr> </thead> <tbody> <tr><td>Pin 2504A</td><td>Fixture</td></tr> <tr><td>Pin 5502A</td><td>Fixture</td></tr> <tr><td>Pin 5506A</td><td>Fixture</td></tr> <tr><td>Robot Gripper</td><td>Load</td></tr> <tr><td>Dump</td><td>Fixture</td></tr> <tr><td>Clamp 2506A</td><td>Fixture</td></tr> <tr><td>Clamp 4502A</td><td>Fixture</td></tr> <tr><td>Clamp 5508B</td><td>Fixture</td></tr> <tr><td>Clamp 5509A</td><td>Fixture</td></tr> <tr><td>Clamp 5516A</td><td>Fixture</td></tr> <tr><td>Clamp 2507A</td><td>Fixture</td></tr> <tr><td>Clamp 3514A</td><td>Fixture</td></tr> <tr><td>Clamp 3514B</td><td>Fixture</td></tr> <tr><td>Pin 5507A</td><td>Fixture</td></tr> <tr><td>Locator 5501A</td><td>Fixture</td></tr> <tr><td>Locator 5503AR</td><td>Fixture</td></tr> <tr><td>Operator Loader</td><td>Fixture</td></tr> <tr><td>Clamp 5505A</td><td>Fixture</td></tr> <tr><td>Clamp 5514AR</td><td>Fixture</td></tr> </tbody> </table>				Resource	Activity	Pin 2504A	Fixture	Pin 5502A	Fixture	Pin 5506A	Fixture	Robot Gripper	Load	Dump	Fixture	Clamp 2506A	Fixture	Clamp 4502A	Fixture	Clamp 5508B	Fixture	Clamp 5509A	Fixture	Clamp 5516A	Fixture	Clamp 2507A	Fixture	Clamp 3514A	Fixture	Clamp 3514B	Fixture	Pin 5507A	Fixture	Locator 5501A	Fixture	Locator 5503AR	Fixture	Operator Loader	Fixture	Clamp 5505A	Fixture	Clamp 5514AR	Fixture
Resource	Activity																																										
Pin 2504A	Fixture																																										
Pin 5502A	Fixture																																										
Pin 5506A	Fixture																																										
Robot Gripper	Load																																										
Dump	Fixture																																										
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Clamp 5508B	Fixture																																										
Clamp 5509A	Fixture																																										
Clamp 5516A	Fixture																																										
Clamp 2507A	Fixture																																										
Clamp 3514A	Fixture																																										
Clamp 3514B	Fixture																																										
Pin 5507A	Fixture																																										
Locator 5501A	Fixture																																										
Locator 5503AR	Fixture																																										
Operator Loader	Fixture																																										
Clamp 5505A	Fixture																																										
Clamp 5514AR	Fixture																																										
<p>Control Assembly Wizard - Step 3 of 5</p> <p>Choose resources of type Clamp that safe-bulkheadclampset will control:</p> <div style="display: flex; justify-content: space-between;"> <div> <p><b>Available resources</b></p> <ul style="list-style-type: none"> <li>Clamp 5503A</li> <li>Clamp 3514A</li> <li>Clamp 3514B</li> <li>Clamp 5514AR</li> <li>Clamp 5501BR</li> <li>Clamp 5503BR</li> <li>Clamp 2507A</li> </ul> </div> <div> <p><b>Controlled resources</b></p> <ul style="list-style-type: none"> <li>Clamp 2506A</li> <li>Clamp 4502</li> <li>Clamp 5508B</li> <li>Clamp 5509A</li> </ul> </div> </div> <p>5590      5592      5594      5596</p> <p>Back Next Finish Cancel</p>																																											
<b>Control Bar Chart</b>																																											
IAM98 Workcell Bar Cha																																											
<b>Control Assembly</b>																																											
<b>Control Assembly</b>																																											



[illegible]

FIG. 67

<b>File   Edit   View   Add   Project   Build   Tools   Window   Help</b>																																							
<p><b>Mechanical Resources</b></p> <ul style="list-style-type: none"> <li>WorkCell IAM98</li> <li><input type="checkbox"/> Fixture Nest 1             <ul style="list-style-type: none"> <li><input type="checkbox"/> ProximitySensor PP1_sw1</li> <li><input type="checkbox"/> ProximitySensor PP1_sw2</li> </ul> </li> <li><input type="checkbox"/> Fixture Nest 2             <ul style="list-style-type: none"> <li><input type="checkbox"/> ProximitySensor PP2_sw1</li> <li><input type="checkbox"/> ProximitySensor PP2_sw2</li> </ul> </li> <li>Robot Gripper05</li> <li>Robot Welding04             <ul style="list-style-type: none"> <li><input type="checkbox"/> Fixture Easel</li> <li><input type="checkbox"/> Clamp 3514A</li> <li><input type="checkbox"/> Clamp 3514B</li> <li><input type="checkbox"/> Clamp 5516A</li> <li><input type="checkbox"/> Clamp 5516B</li> <li><input type="checkbox"/> Clamp 4502</li> <li><input type="checkbox"/> Clamp 5509A</li> <li><input type="checkbox"/> Clamp 2507A</li> <li><input type="checkbox"/> Clamp 2506A</li> <li><input type="checkbox"/> Clamp 5505A</li> <li><input type="checkbox"/> Clamp 5508B</li> <li><input type="checkbox"/> Clamp 5514AR</li> <li><input type="checkbox"/> Clamp 5501BR</li> <li><input type="checkbox"/> Clamp 5503BR</li> </ul> </li> </ul>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><b>Mechanical Timing Diagram</b></p> <p>IAM98 Workcell Timing Diagram</p> </div> <div style="width: 45%;"> <p><b>Add Control Assembly</b></p> <p>Control Assembly Type</p> <p>part-present NachISA160-controller safe-bulkheadclampset pinset locatorset dumpset</p> <p>New Cancel</p> </div> </div> <div style="margin-top: 10px;"> <p><b>Activity</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Resource</th> <th>Activity</th> </tr> </thead> <tbody> <tr><td>Pin 2504A</td><td>Fixture</td></tr> <tr><td>Pin 5502A</td><td>Fixture</td></tr> <tr><td>Pin 5506A</td><td>Fixture</td></tr> <tr><td>Robot Gripper</td><td>Load</td></tr> <tr><td>Dump</td><td>Fixture</td></tr> <tr><td>Clamp 2506A</td><td>Fixture</td></tr> <tr><td>Clamp 4502A</td><td>Fixture</td></tr> <tr><td>Clamp 5508B</td><td>Fixture</td></tr> <tr><td>Clamp 5509A</td><td>Fixture</td></tr> <tr><td>Clamp 5516A</td><td>Fixture</td></tr> <tr><td>Clamp 2507A</td><td>Fixture</td></tr> <tr><td>Clamp 3514A</td><td>Fixture</td></tr> <tr><td>Clamp 3514B</td><td>Fixture</td></tr> <tr><td>Pin 5507A</td><td>Fixture</td></tr> <tr><td>Locator 5501A</td><td>Fixture</td></tr> <tr><td>Operator Loader</td><td>Fixture</td></tr> <tr><td>Clamp 5505A</td><td>Fixture</td></tr> <tr><td>Clamp 5514AR</td><td>Fixture</td></tr> </tbody> </table> </div>	Resource	Activity	Pin 2504A	Fixture	Pin 5502A	Fixture	Pin 5506A	Fixture	Robot Gripper	Load	Dump	Fixture	Clamp 2506A	Fixture	Clamp 4502A	Fixture	Clamp 5508B	Fixture	Clamp 5509A	Fixture	Clamp 5516A	Fixture	Clamp 2507A	Fixture	Clamp 3514A	Fixture	Clamp 3514B	Fixture	Pin 5507A	Fixture	Locator 5501A	Fixture	Operator Loader	Fixture	Clamp 5505A	Fixture	Clamp 5514AR	Fixture
Resource	Activity																																						
Pin 2504A	Fixture																																						
Pin 5502A	Fixture																																						
Pin 5506A	Fixture																																						
Robot Gripper	Load																																						
Dump	Fixture																																						
Clamp 2506A	Fixture																																						
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Operator Loader	Fixture																																						
Clamp 5505A	Fixture																																						
Clamp 5514AR	Fixture																																						
<p><b>Control Resources</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Part-Present</li> <li><input type="checkbox"/> NachISA160-controller</li> <li><input type="checkbox"/> Safe-BulkheadClampSet</li> <li><input type="checkbox"/> PinSet</li> <li><input type="checkbox"/> LocatorSet</li> <li><input type="checkbox"/> DumpSet</li> </ul>	<p><b>Control Bar Chart</b></p> <p>IAM98 Workcell Bar Chart</p>																																						

FIG. 68

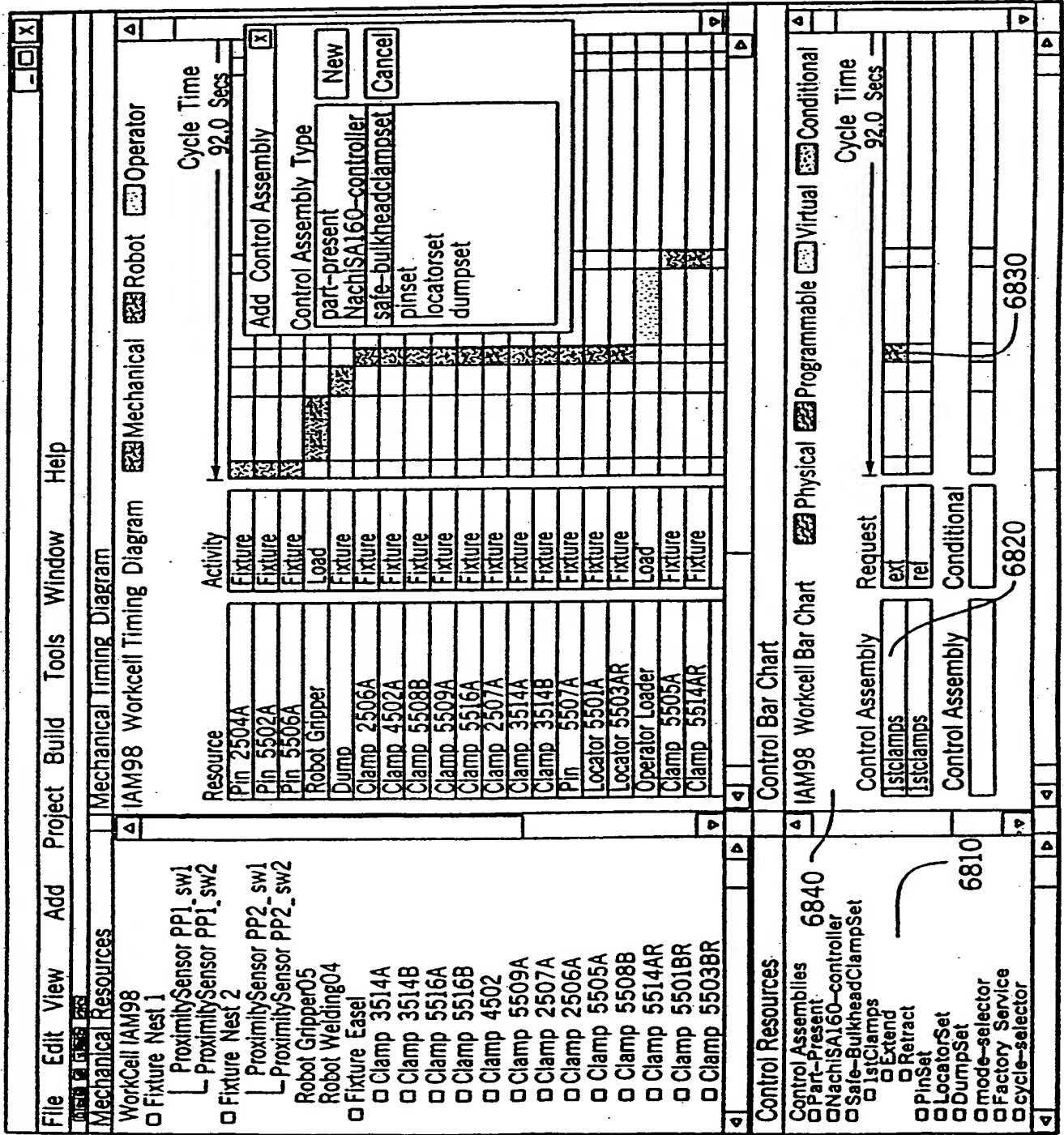




FIG. 69

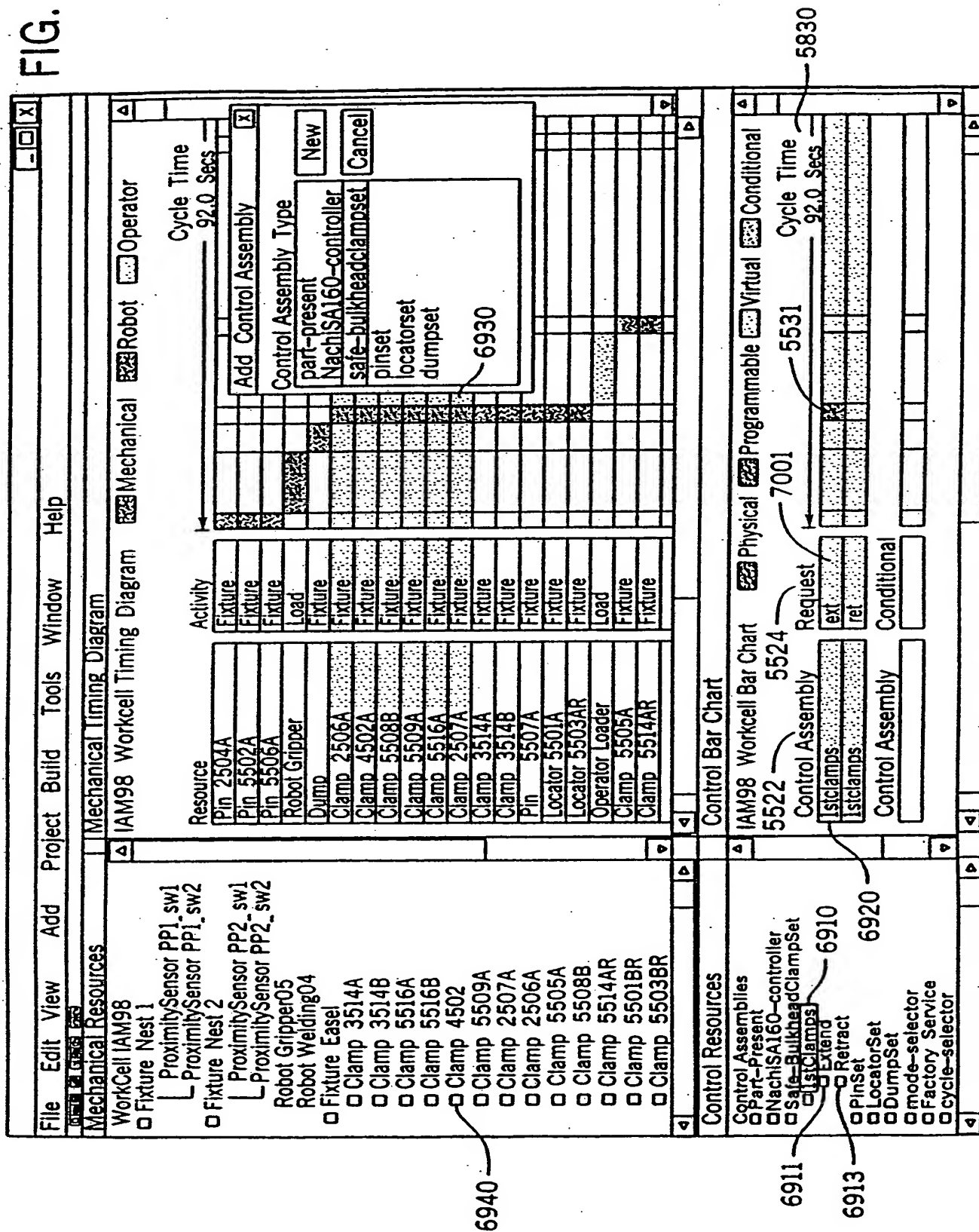


FIG. 70

FIG. 71

File		Edit	View	Add	Project	Build	Tools	Window	Help
Mechanical		Font		Timing Diagram					
Work Cell		Mechanical View		Add Control Assembly					
<input type="checkbox"/> Fixture Nest <input type="checkbox"/> Pr <input type="checkbox"/> Pr <input type="checkbox"/> Fixture Nest <input type="checkbox"/> Pr <input type="checkbox"/> Pr <input type="checkbox"/> Control Resources Complete <input type="checkbox"/> Pr <input type="checkbox"/> Pr Robot Gripper05 Robot Welding04 <input type="checkbox"/> Fixture Easel <input type="checkbox"/> Clamp 3514A <input type="checkbox"/> Clamp 3514B <input type="checkbox"/> Clamp 5516A <input type="checkbox"/> Clamp 5516B <input type="checkbox"/> Clamp 4502 <input type="checkbox"/> Clamp 5509A <input type="checkbox"/> Clamp 2507A <input type="checkbox"/> Clamp 2506A <input type="checkbox"/> Clamp 5505A <input type="checkbox"/> Clamp 5508B <input type="checkbox"/> Clamp 5514AR <input type="checkbox"/> Clamp 5501BR <input type="checkbox"/> RobotWelder <input type="checkbox"/> Clamp 2506A <input type="checkbox"/> Clamp 4502A <input type="checkbox"/> Clamp 5508B <input type="checkbox"/> Clamp 5509A <input type="checkbox"/> Clamp 5516A <input type="checkbox"/> Clamp 5516B <input type="checkbox"/> Clamp 5505A		06A 02A 08B 09A 16A 07A 14A Clamp 3514B Pin 5507A Locator 5501A Locator 5503AR Operator Loader Clamp 5505A Clamp 5514AR Clamp 5503BR Clamp 5501BR RobotWelder Clamp 2506A Clamp 4502A Clamp 5508B Clamp 5509A Clamp 5516A Clamp 5516B Clamp 5505A UnFixture UnFixture UnFixture UnFixture UnFixture UnFixture UnFixture		Control Assembly Type part-present NachiSA160-controller safe-bulkheadclampset pinset locatorset dumpset		New Cancel			
Control Resources		Control Bar Chart		Control Bar Chart					
Control Assemblies <input type="checkbox"/> Part-Present <input type="checkbox"/> NachiSA160-controller <input type="checkbox"/> Safe-BulkheadClampSet <input type="checkbox"/> 1stClamps <input type="checkbox"/> Extend <input type="checkbox"/> Retract <input type="checkbox"/> PinSet <input type="checkbox"/> LocatorSet <input type="checkbox"/> DumpSet <input type="checkbox"/> mode-selector <input type="checkbox"/> Factory Service		IAM98 Workcell Bar Chart <input checked="" type="checkbox"/> Physical <input type="checkbox"/> Programmable <input type="checkbox"/> Virtual <input type="checkbox"/> Conditional Cycle Time 92.0 Secs		Request ext ret Conditional Control Assembly 1stclamps 1stclamps Control Assembly Conditional					

5548

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5820

5830

FIG. 72

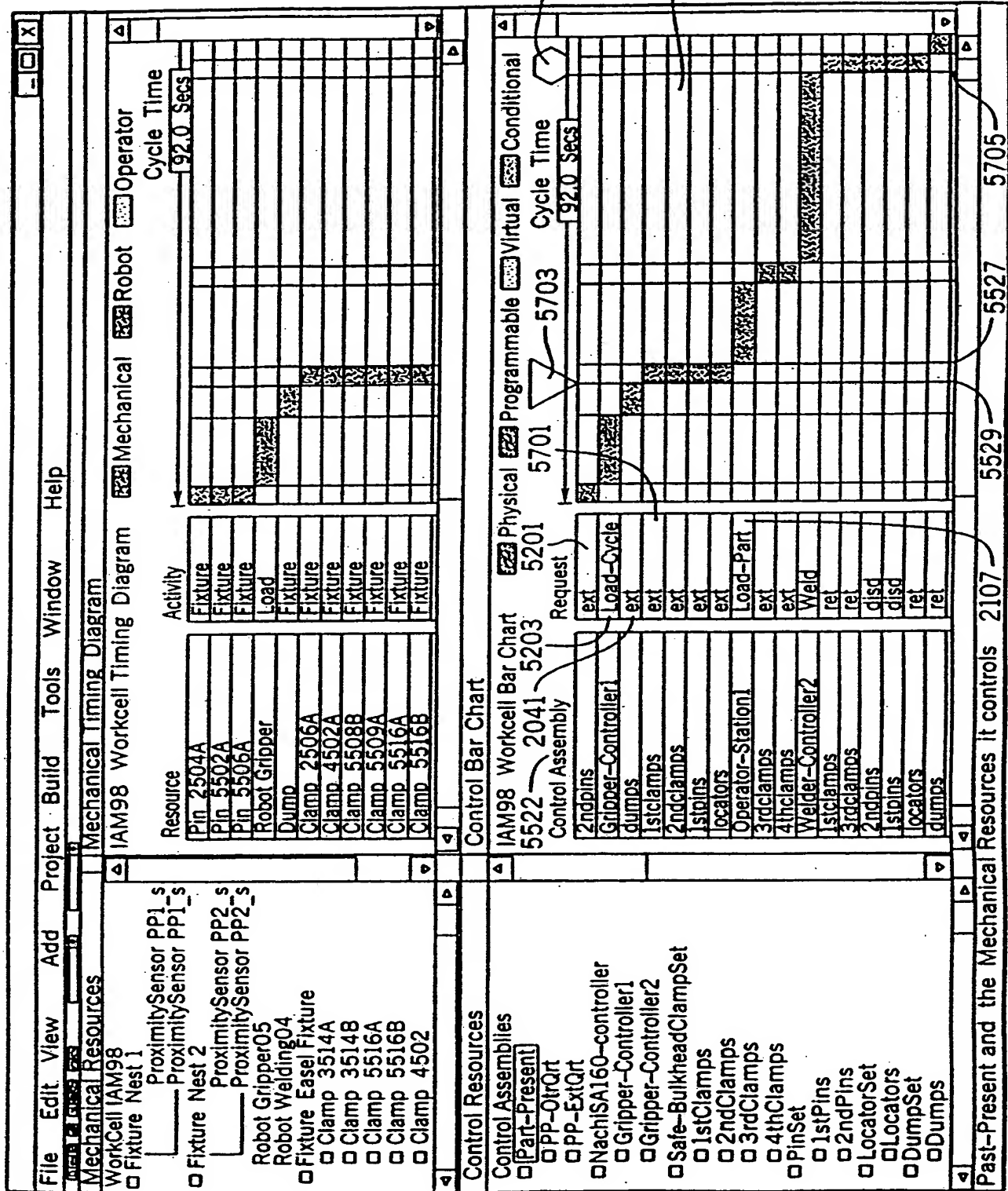


FIG. 73

File Edit View Add Project Build Tools Window Help									
Mechanical Resources									
WorkCell IAM98									
<input type="checkbox"/> Fixture Nest 1 <input type="checkbox"/> ProximitySensor PP1_s <input type="checkbox"/> ProximitySensor PP1_s <input type="checkbox"/> Fixture Nest 2 <input type="checkbox"/> ProximitySensor PP2_s <input type="checkbox"/> ProximitySensor PP2_s Robot Gripper05 Robot Welding04 <input type="checkbox"/> Fixture Easel Fixture <input type="checkbox"/> Clamp 3514A <input type="checkbox"/> Clamp 3514B <input type="checkbox"/> Clamp 5516A <input type="checkbox"/> Clamp 5516B <input type="checkbox"/> Clamp 4502									
Mechanical Timing Diagram									
IAM98 Workcell Timing Diagram <input checked="" type="checkbox"/> Mechanical <input checked="" type="checkbox"/> Robot <input type="checkbox"/> Operator									
Resource		Activity		Cycle Time					
Pin 2504A		Fixture		92.0 Secs					
Pin 5502A		Fixture							
Pin 5506A		Fixture							
Robot Gripper		Load							
Dump		Fixture							
Clamp 2506A		Fixture							
Clamp 4502A		Fixture							
Clamp 5508B		Fixture							
Clamp 5509A		Fixture							
Clamp 5516A		Fixture							
Clamp 5516B		Fixture							
Control Bar Chart									
IAM98 Workcell Bar Chart <input checked="" type="checkbox"/> Physical <input checked="" type="checkbox"/> Programmable <input type="checkbox"/> Virtual <input type="checkbox"/> Conditional									
Control Resources		Control Assembly		Request		Cycle Time			
Control Assemblies		2ndpins		ext		92.0 Secs			
<input type="checkbox"/> Part--Present		Gripper-Controller1		Load-Cycle					
<input type="checkbox"/> PP-QtQt		dumps		ext					
<input type="checkbox"/> PP-ExtQt		1stclamps		ext					
<input type="checkbox"/> NachISA160-controller		2ndclamps		ext					
<input type="checkbox"/> Gripper-Controller1		1stpins		ext					
<input type="checkbox"/> Gripper-Controller2		locators		ext					
<input type="checkbox"/> Safe-BulkheadClampSet		Operator-Station1		Load-Part					
<input type="checkbox"/> 1stClamps		3rdclamps		ext					
<input type="checkbox"/> 2ndClamps		4thclamps		ext					
<input type="checkbox"/> 3rdClamps		Welder-Controller2		Weld					
<input type="checkbox"/> 4thClamps		1stclamps		ret					
<input type="checkbox"/> PinSet		3rdclamps		ret					
<input type="checkbox"/> 1stPins		2ndpins		disd					
<input type="checkbox"/> 2ndPins		1stpins		disd					
<input type="checkbox"/> LocatorSet		locators		ret					
<input type="checkbox"/> Locators		dumps		ret					
<input type="checkbox"/> DumpSet									
<input type="checkbox"/> Dumps									
2ndPins and the Mechanical Resources it controls									

FIG. 74

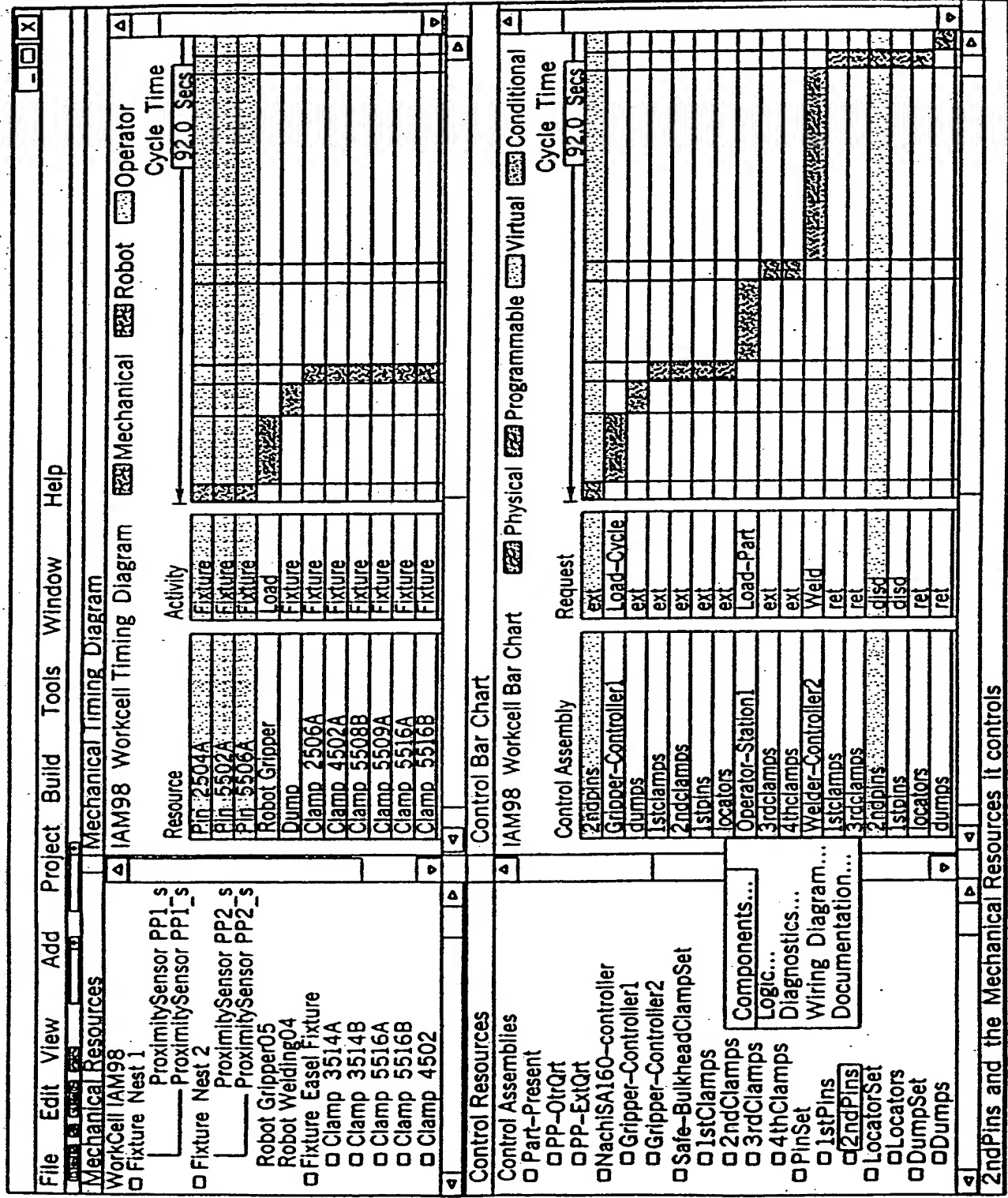


FIG. 75

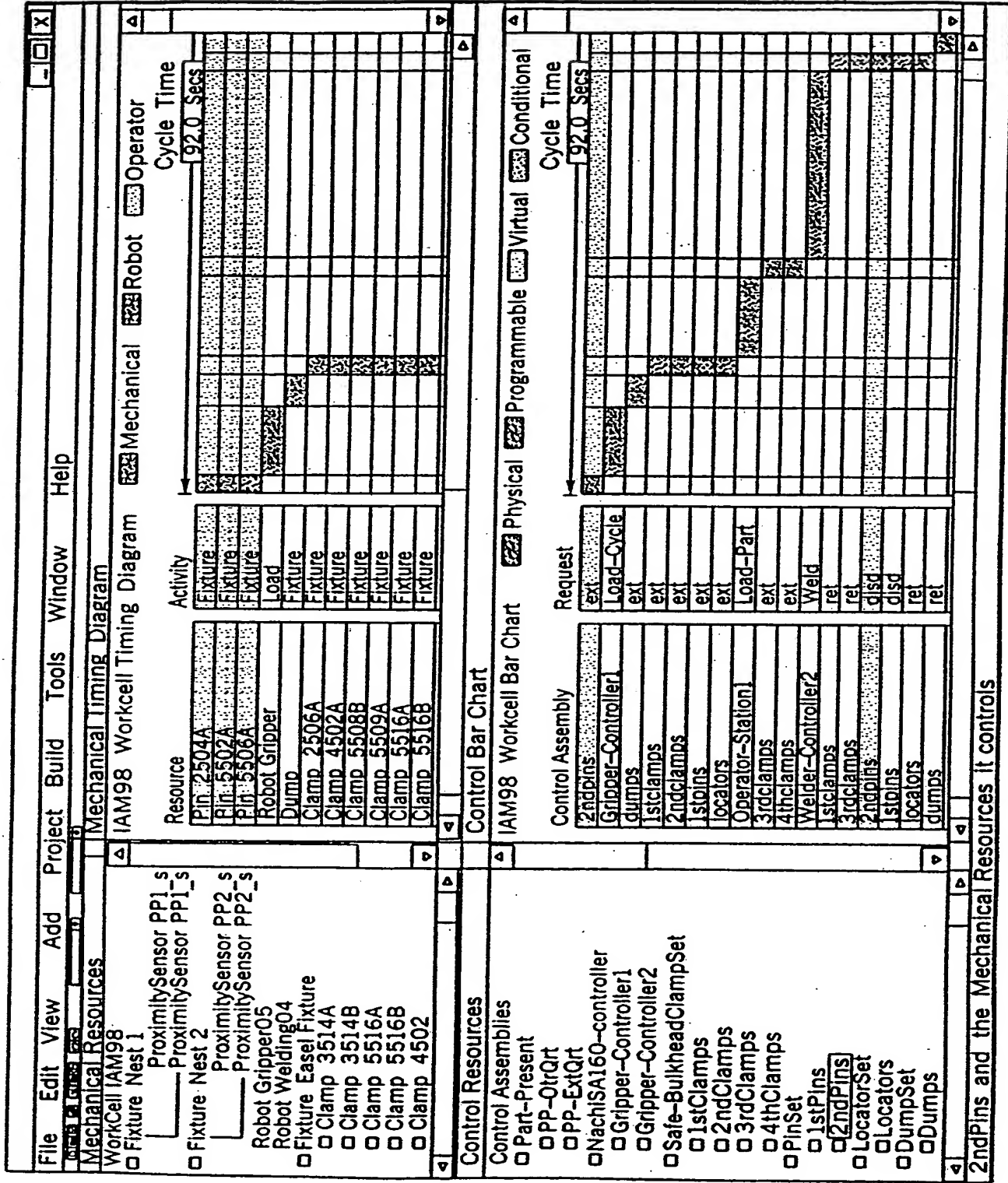




FIG. 76

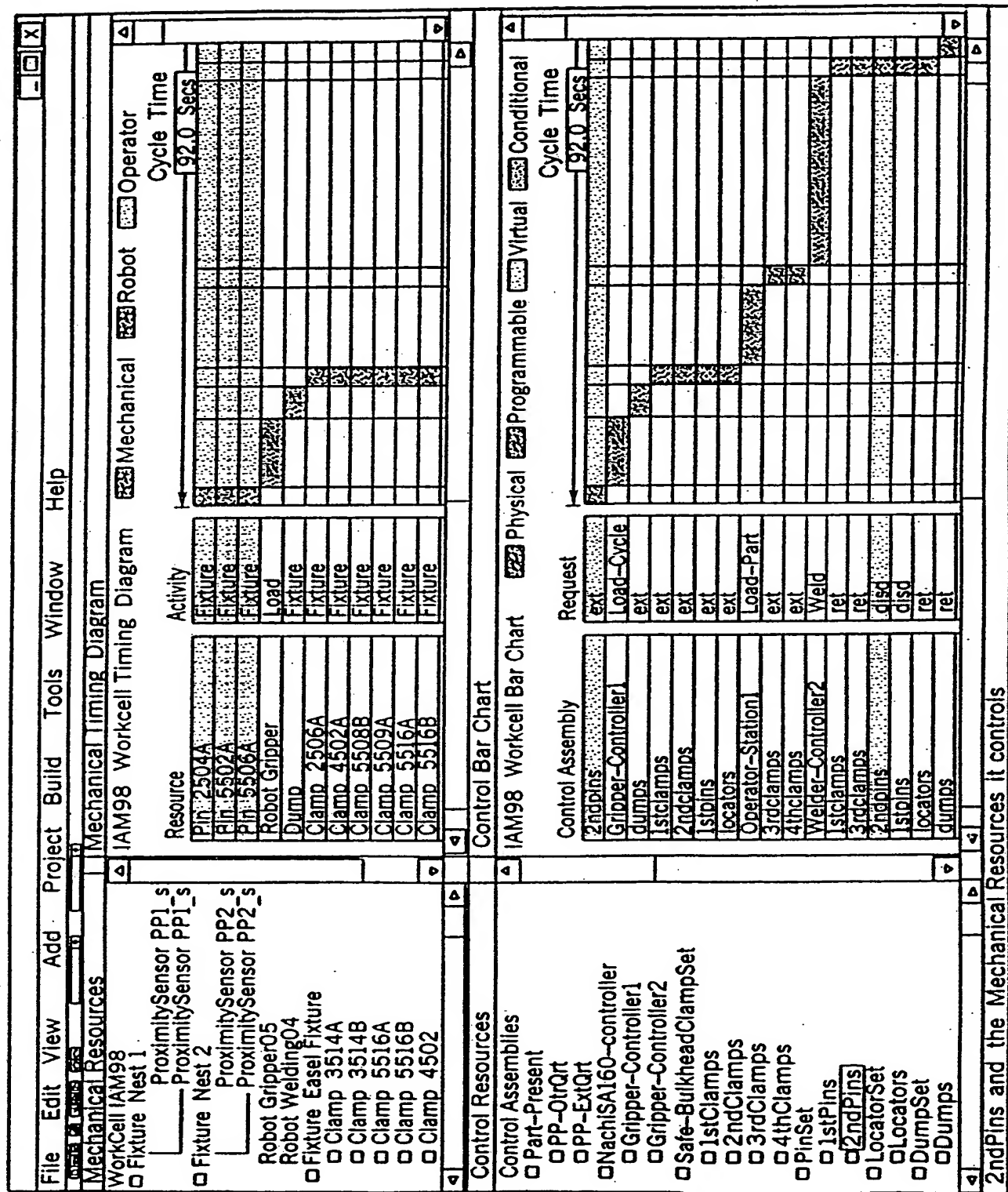




FIG. 77

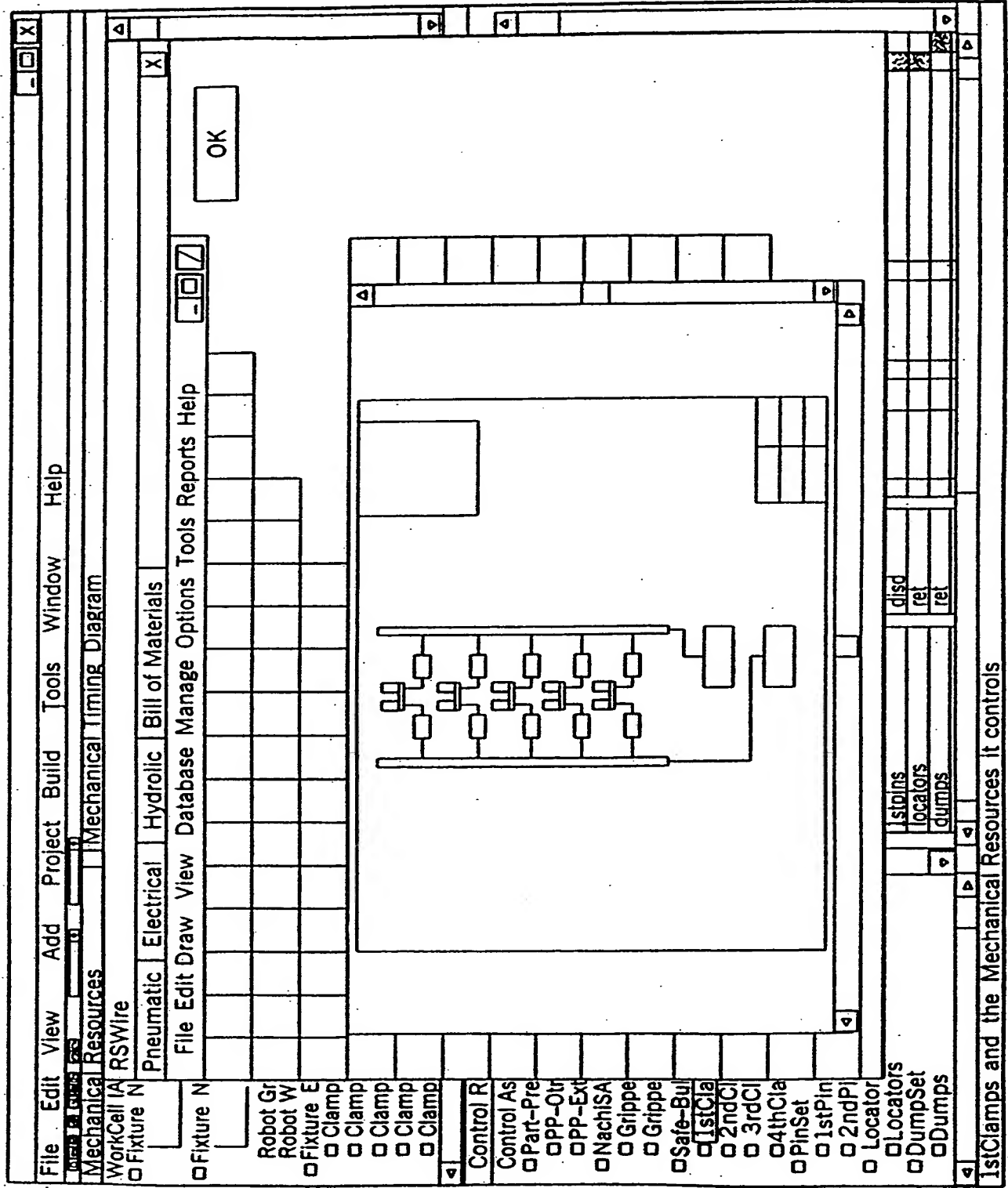


FIG. 78

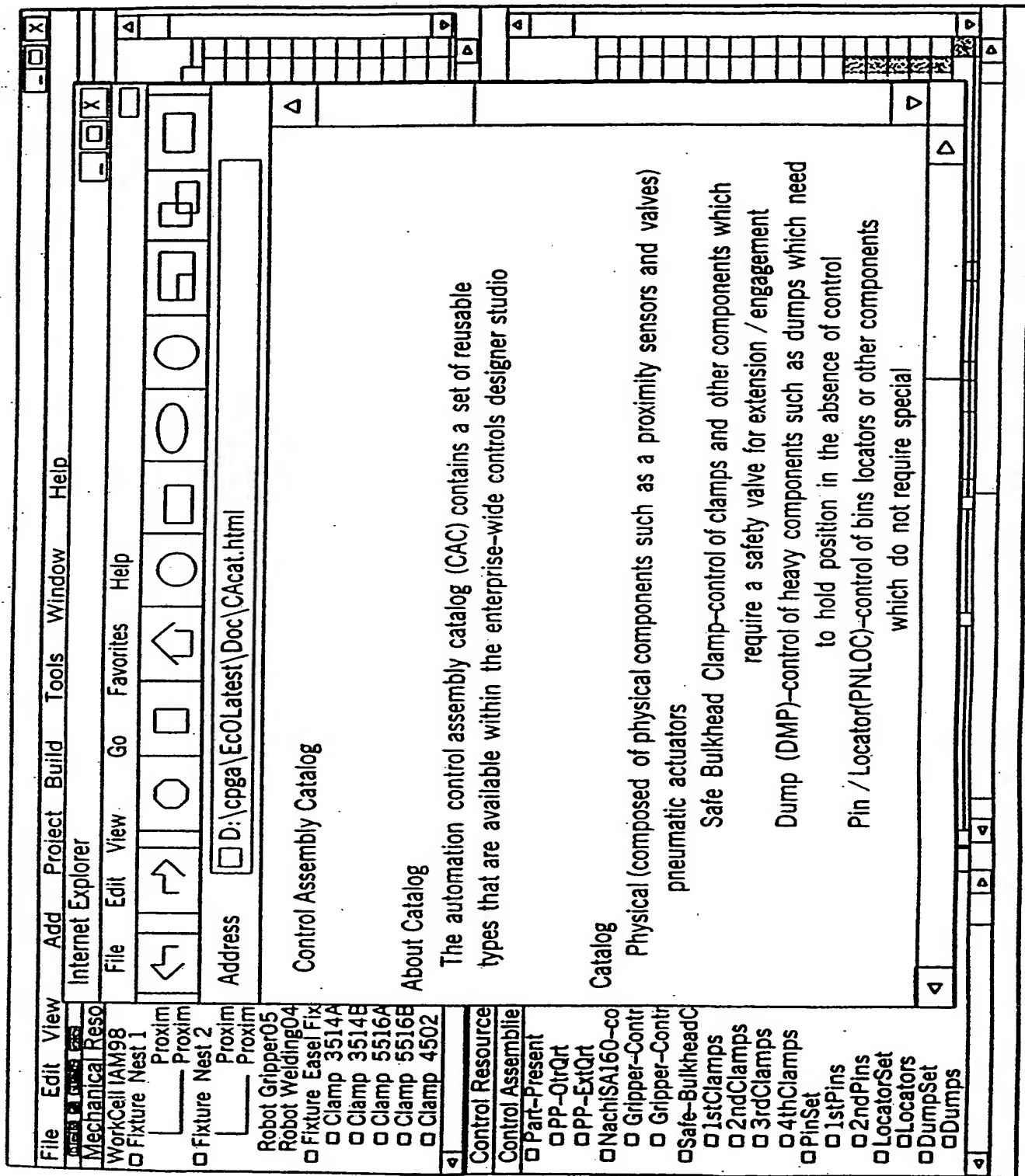
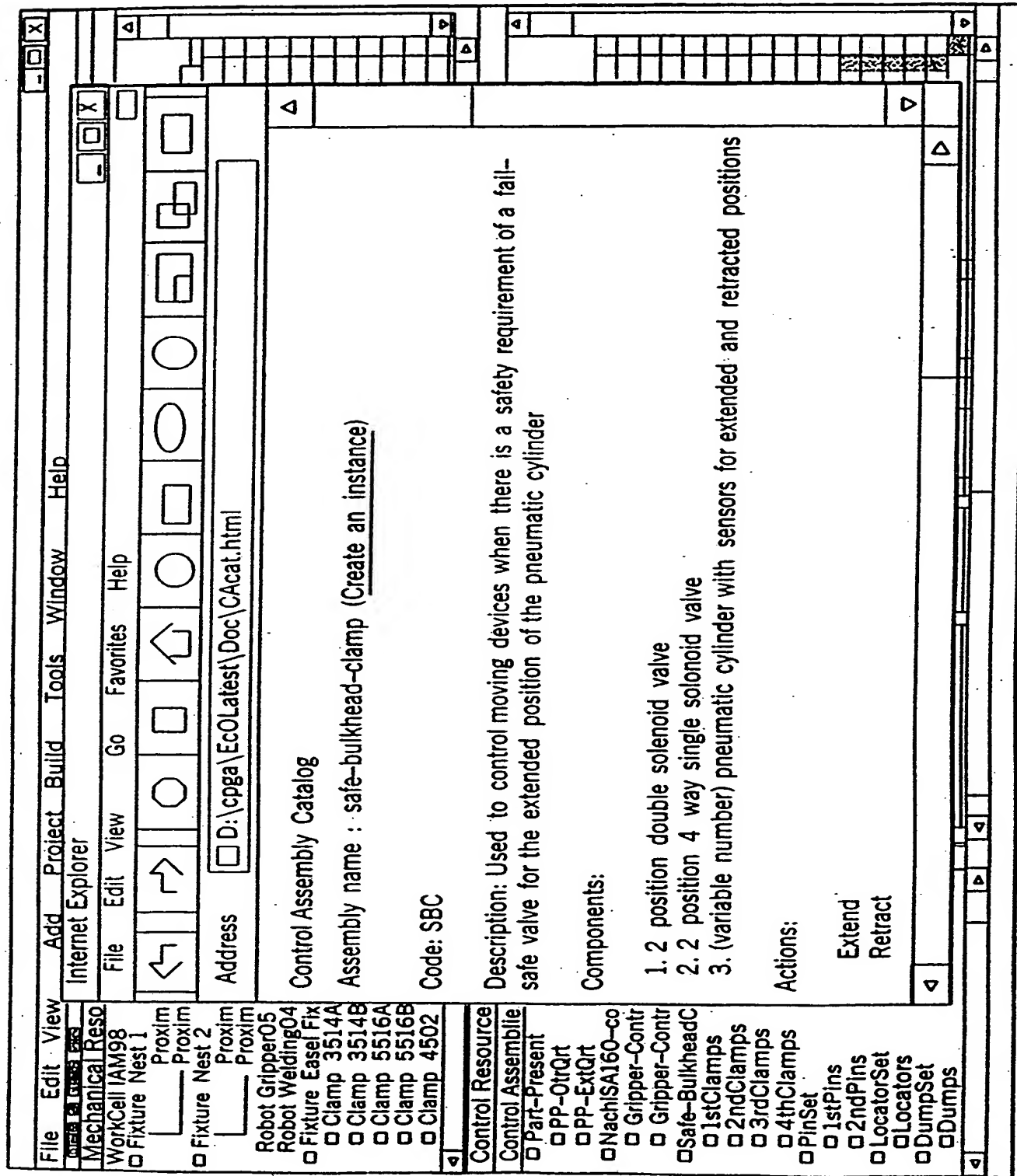


FIG. 79



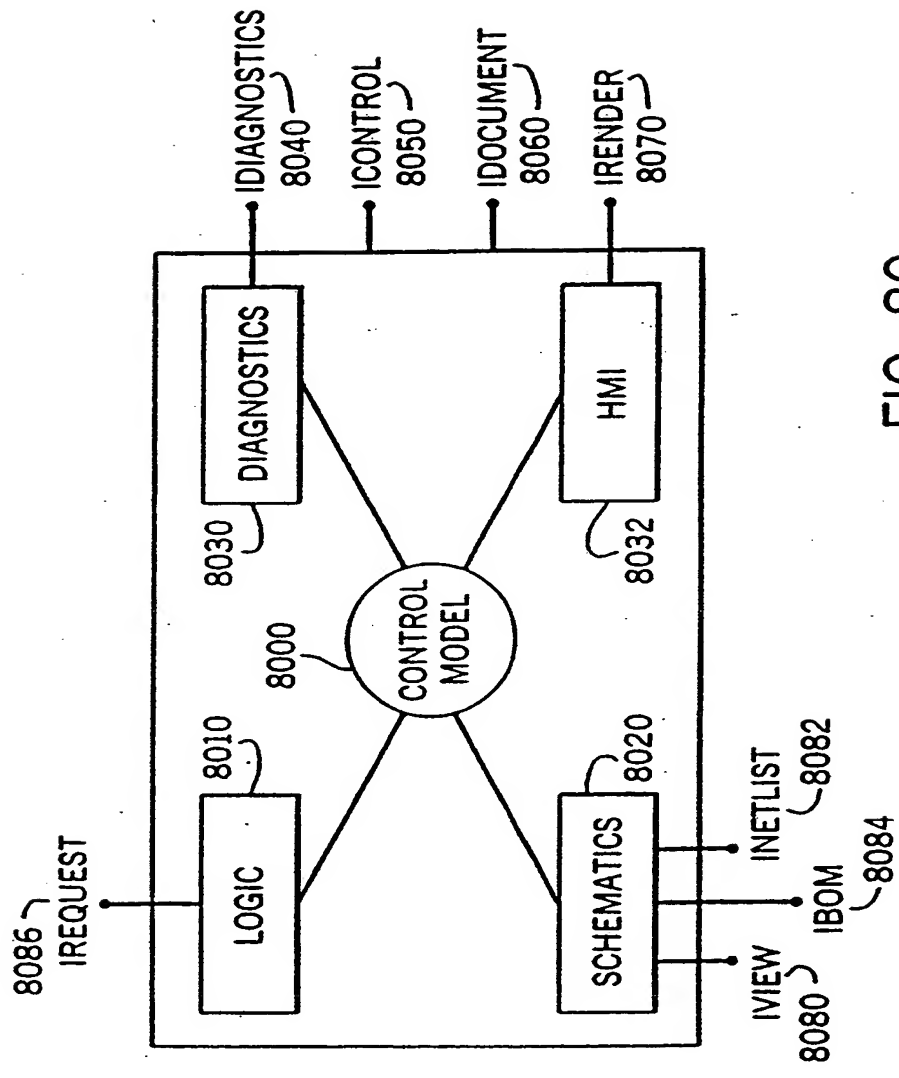


FIG. 80

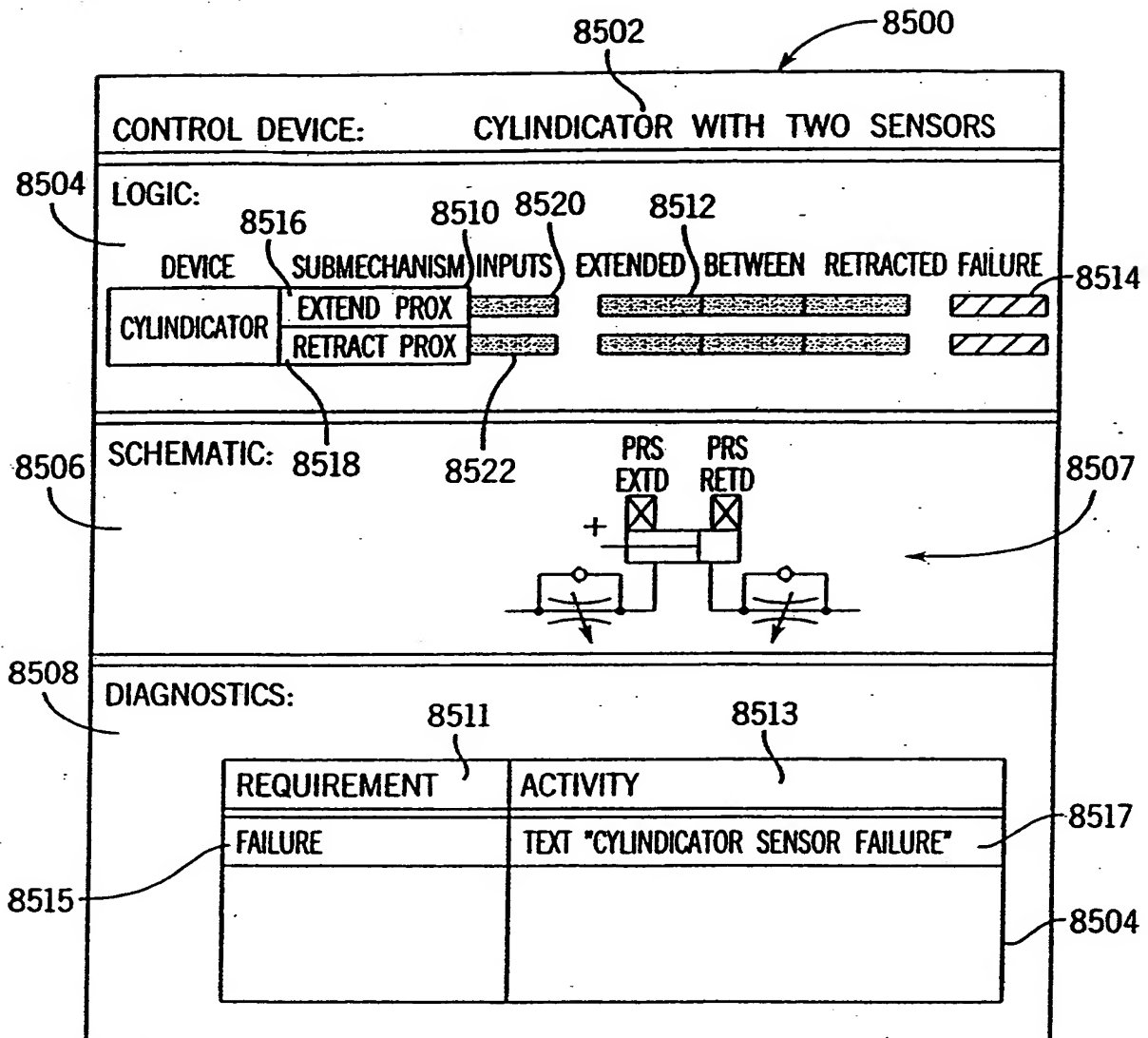


FIG. 81

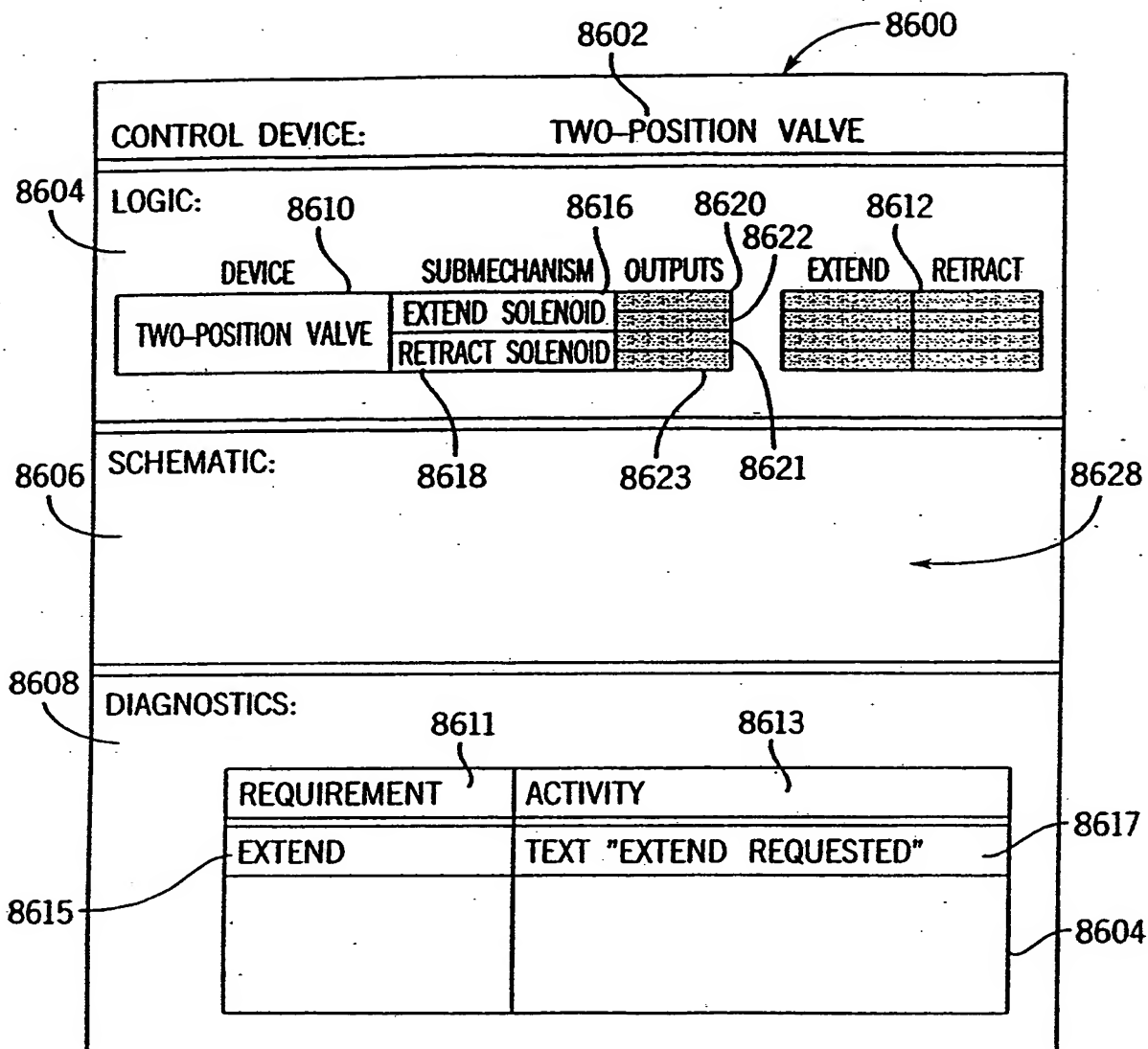


FIG. 82

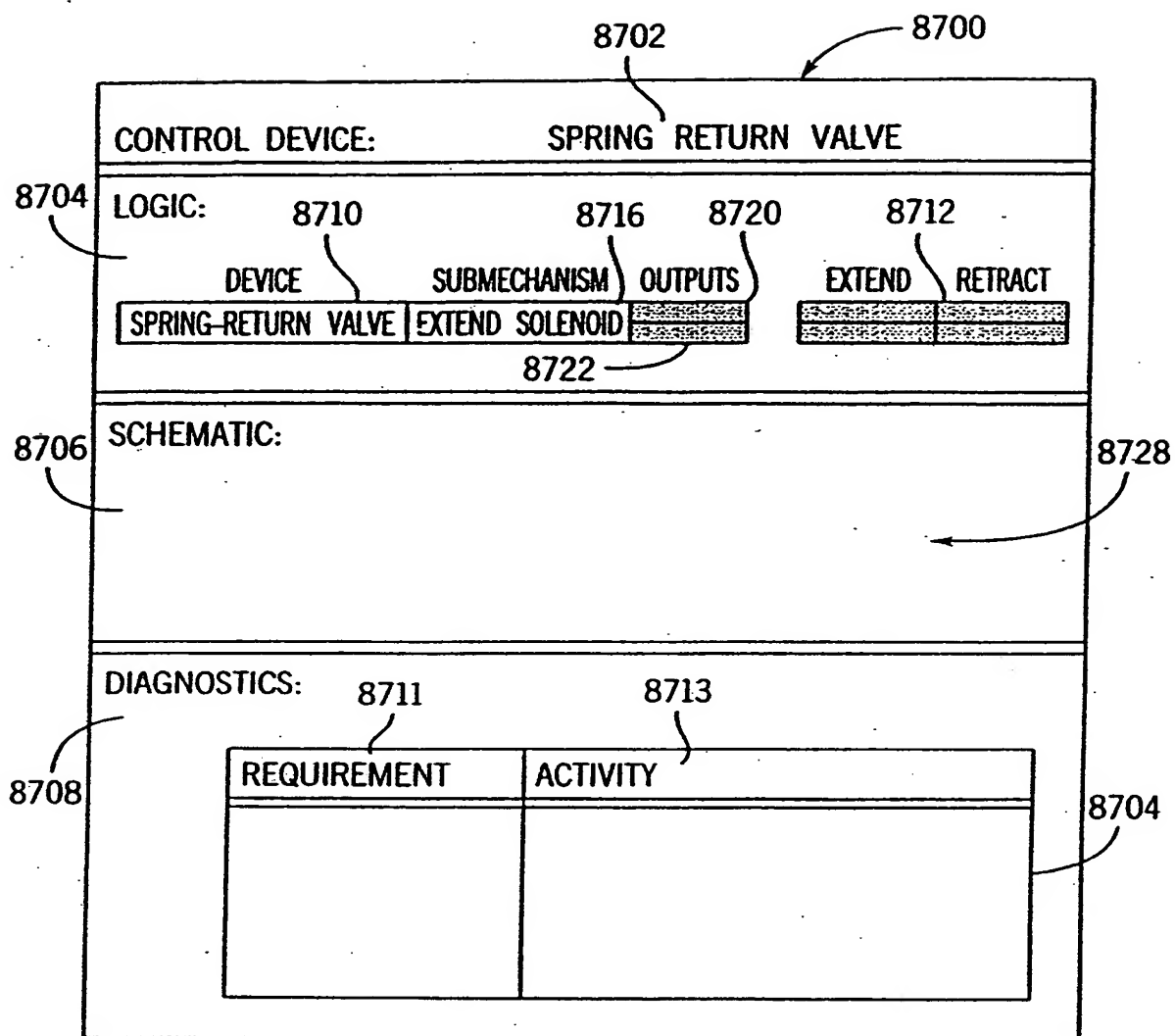


FIG. 83

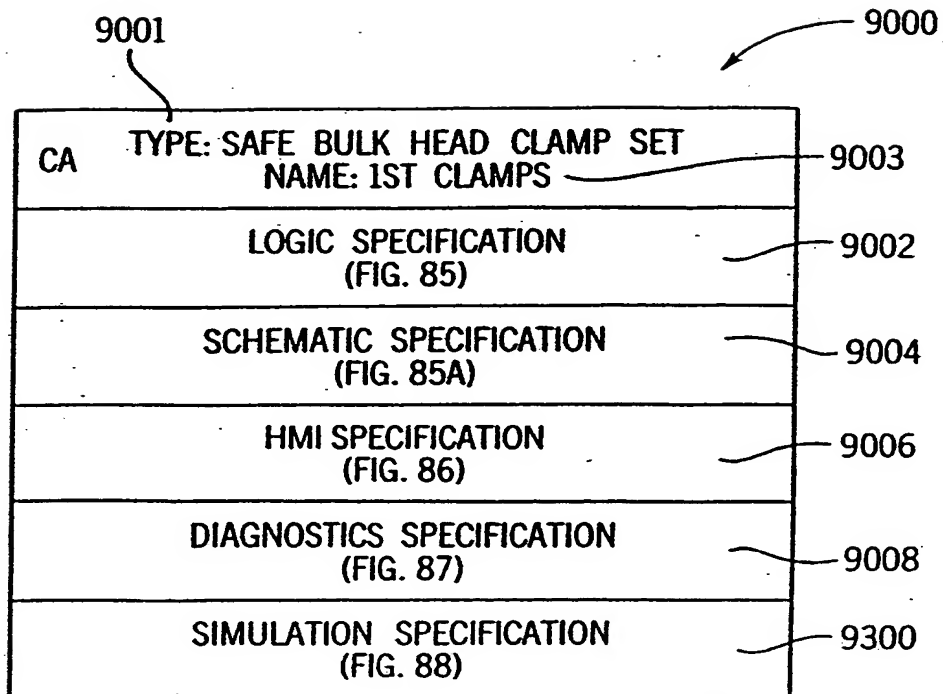


FIG. 84

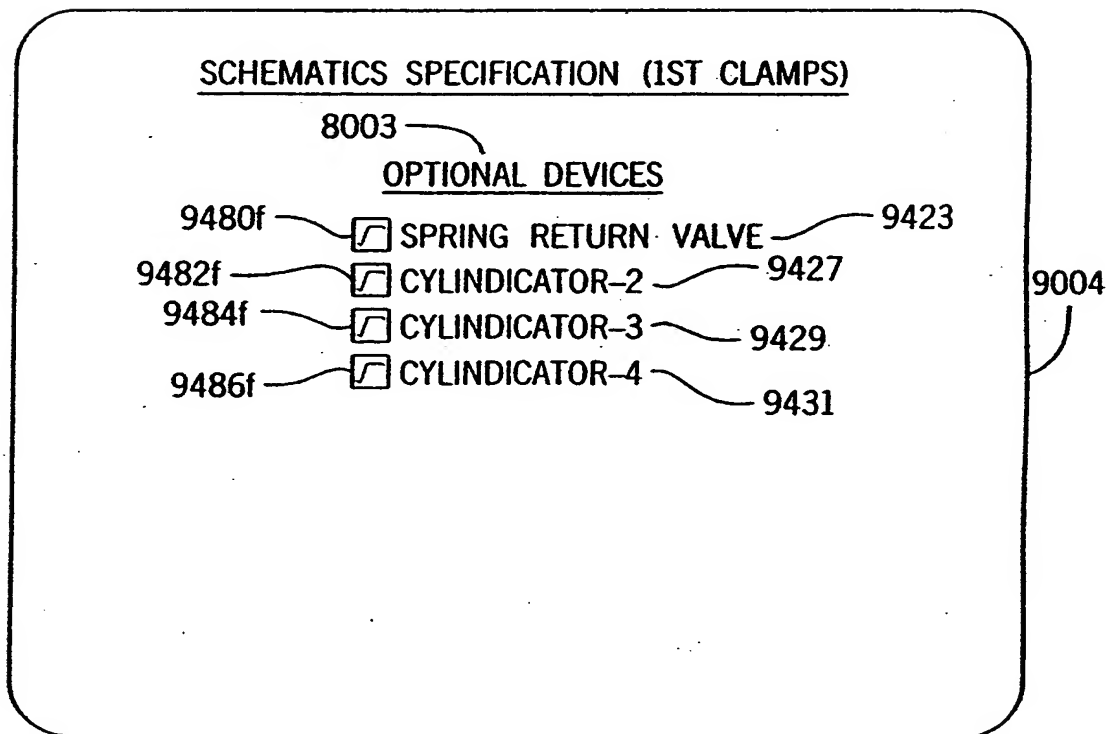
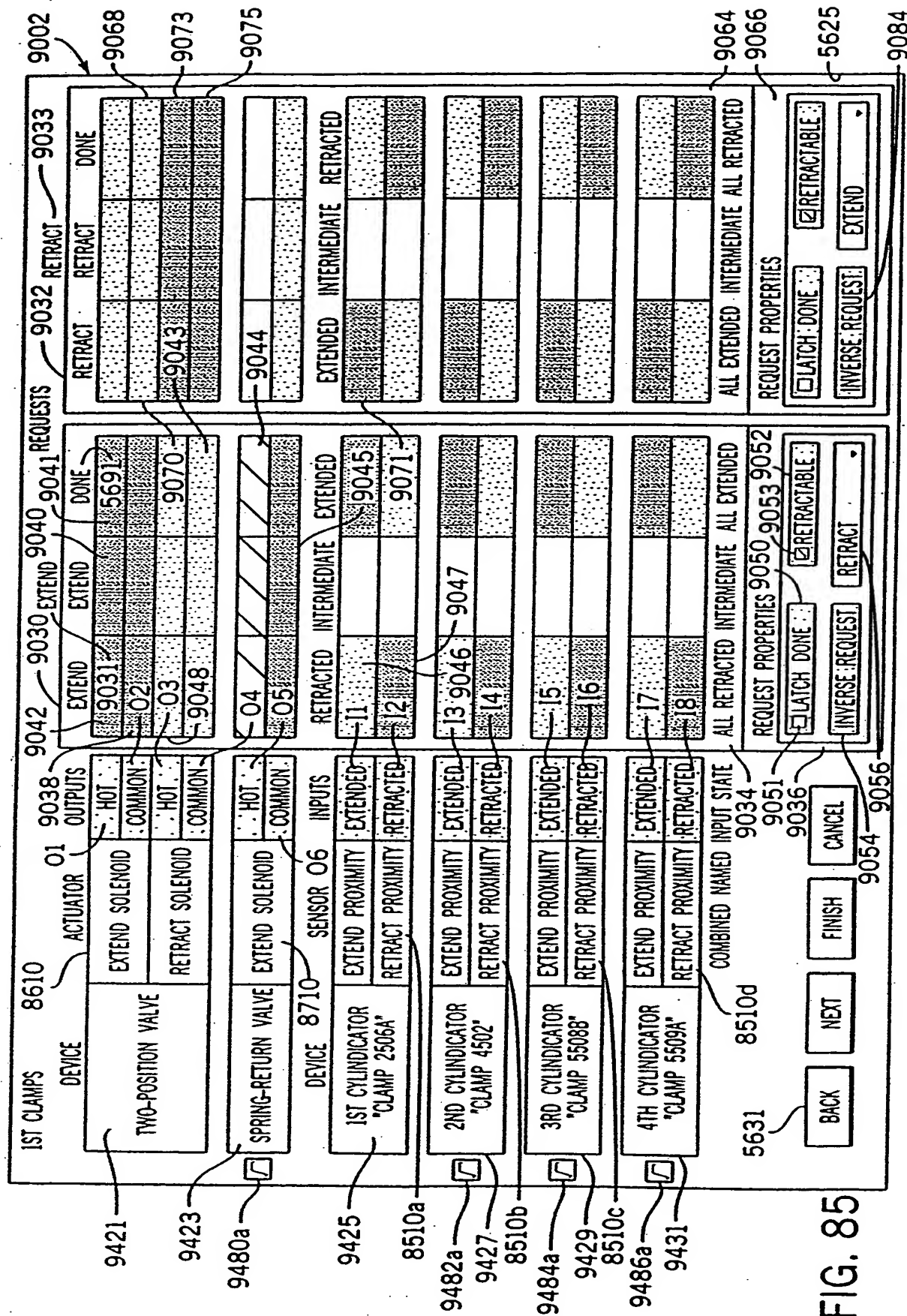


FIG. 85A





9460

**HMI SPECIFICATION (1ST CLAMPS)**

1ST CLAMPS		9464 MONITORABLE I/O				9466 CONTROLLABLE OUTPUTS / REQ.			
9462 DEVICE		01	02	03	04	01	02	03	04
9421 TWO-POS. VALVE		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9423 <input checked="" type="checkbox"/> SPRING RET. VALVE		05	<input type="checkbox"/>	06	<input type="checkbox"/>	05	<input type="checkbox"/>	06	<input type="checkbox"/>
9480b 9425 <input checked="" type="checkbox"/> 1ST CYLINDICATOR		11	<input checked="" type="checkbox"/>	12	<input checked="" type="checkbox"/>	-	-	-	-
<input checked="" type="checkbox"/> 2ND CYLINDICATOR		13	<input type="checkbox"/>	14	<input type="checkbox"/>	-	-	-	-
9482b <input checked="" type="checkbox"/> 3RD CYLINDICATOR		15	<input type="checkbox"/>	16	<input type="checkbox"/>	-	-	-	-
<input checked="" type="checkbox"/> 4TH CYLINDICATOR		17	<input type="checkbox"/>	18	<input type="checkbox"/>	-	-	-	-
9484b						MANUAL	<input checked="" type="checkbox"/>	9490	
9486b	9431					EXTEND	<input checked="" type="checkbox"/>	9492	
	9429					RETRACT	<input checked="" type="checkbox"/>	9492	

9006

FIG. 86

9600

**DIAGNOSTICS SPECIFICATION (1ST CLAMPS)**

9602 DEVICE / REQ.	9604 REQUIREMENT	9606 ACTIVITY
9425 9427 9482c 1ST CYLINDICATOR	9622 1ST CLAMPS CYLINDER FAILURE	2001 TEXT: "CYLINDICATOR ..."
<input checked="" type="checkbox"/> 2ND CYLINDICATOR	9429 ...	TEXT: "..."
<input checked="" type="checkbox"/> 3RD CYLINDICATOR	2002 ...	TEXT: "..."
9484c <input checked="" type="checkbox"/> 4TH CYLINDICATOR	2003 ...	TEXT: "..."
9486c 9431 ...	1ST CLAMPS 11 PASSIVE	TEXT: "EXTENSION NOT CONFIRMED"
9616 EXTEND 1ST CYLINDICATOR	...	TEXT: "RETRACTION NOT CONFIRMED"
9618 RETRACT 1ST CYLINDICATOR	9624 ...	

8517

9626

FIG. 87

STATUS BASED DIAGNOSTICS SPECIFICATION (1ST CLAMPS)																	
REQUEST	REQUIREMENT																
	01	02	03	04	05	06	11	12	13	14	15	16	17	18	ACTIVITY		
3505 3515 3511 3517 9480g 3519 3520 9482g 9484g 9486g 3513 3521 9480g 9482g 9484g 9486g	1	1	0	0	-	-	-	-	-	-	-	-	-	-	TEXT: "TWO-POSITION VALVE EXTEND"		
	-	-	-	-	1	1	-	-	-	-	-	-	-	-	TEXT: "SPRING-RETURN VALVE EXTEND"		
	-	-	-	-	-	-	1	0	-	-	-	-	-	-	TEXT: "1ST CYLINDRATOR EXTEND"		
	-	-	-	-	-	-	-	-	1	0	-	-	-	-	TEXT: "2ND CYLINDRATOR EXTEND"		
	-	-	-	-	-	-	-	-	-	-	1	0	-	-	TEXT: "3RD CYLINDRATOR EXTEND"		
	-	-	-	-	-	-	-	-	-	-	-	-	1	0	TEXT: "4TH CYLINDRATOR EXTEND"		
	0	0	1	1	-	-	-	-	-	-	-	-	-	-	TEXT: "TWO-POSITION VALVE RETRACT"		
	-	-	-	-	0	0	-	-	-	-	-	-	-	-	TEXT: "SPRING-RETURN VALVE RETRACT"		
	-	-	-	-	-	-	0	1	-	-	-	-	-	-	TEXT: "1ST CYLINDRATOR RETRACT"		
	-	-	-	-	-	-	-	-	0	1	-	-	-	-	TEXT: "2ND CYLINDRATOR RETRACT"		
	-	-	-	-	-	-	-	-	-	-	0	1	-	-	TEXT: "3RD CYLINDRATOR RETRACT"		
	-	-	-	-	-	-	-	-	-	-	-	-	0	1	TEXT: "4TH CYLINDRATOR RETRACT"		

FIG. 87A

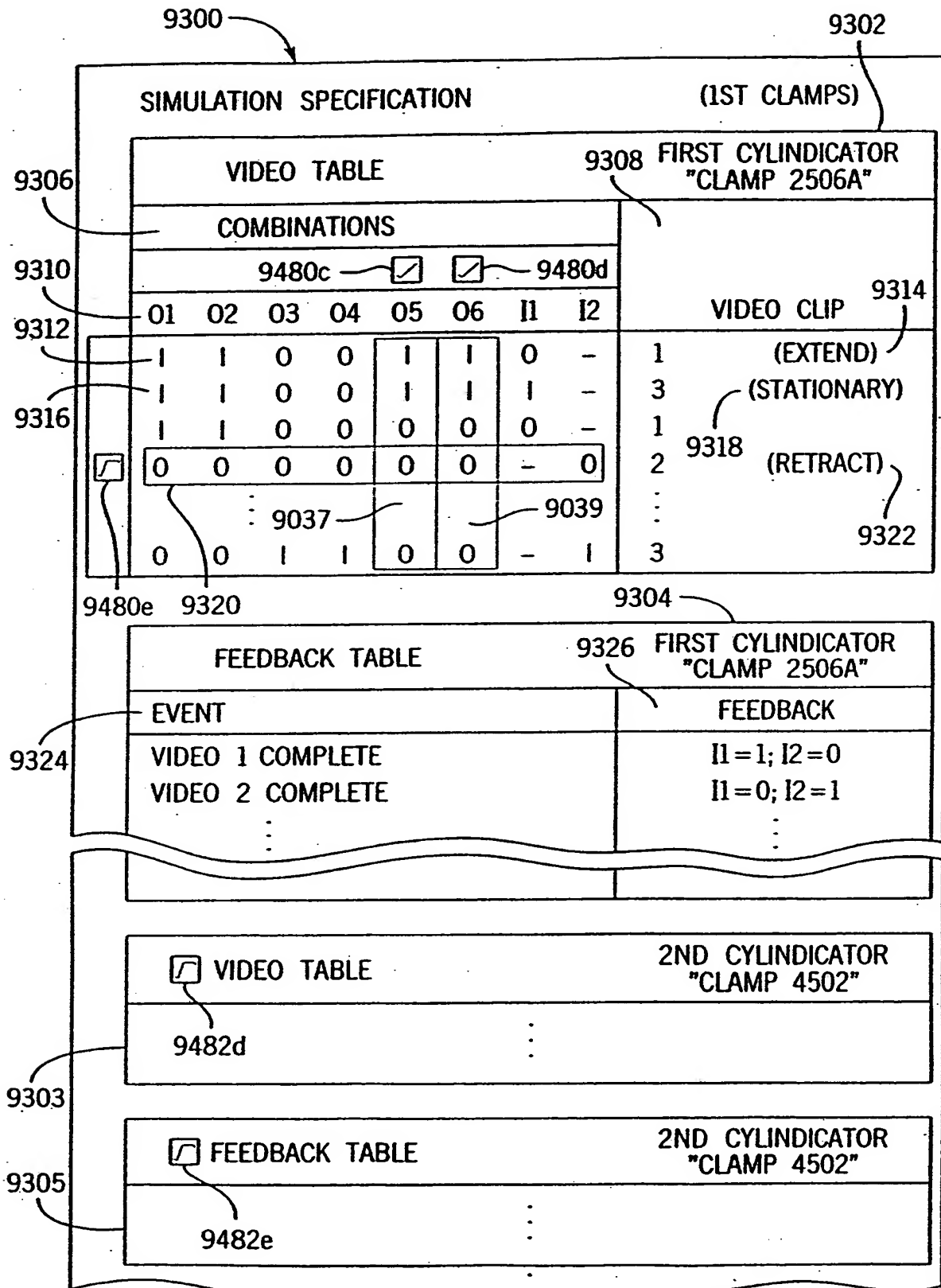


FIG. 88

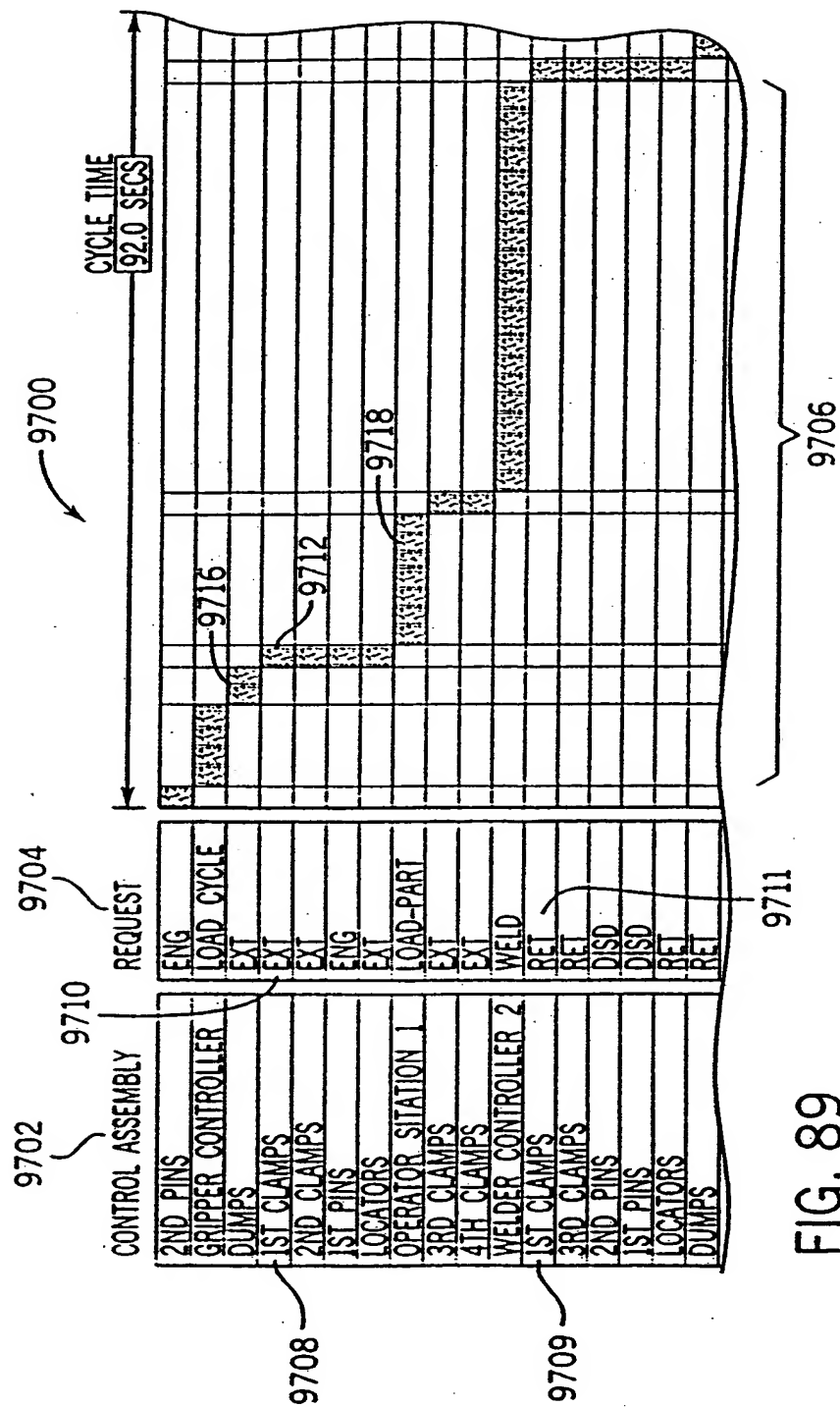
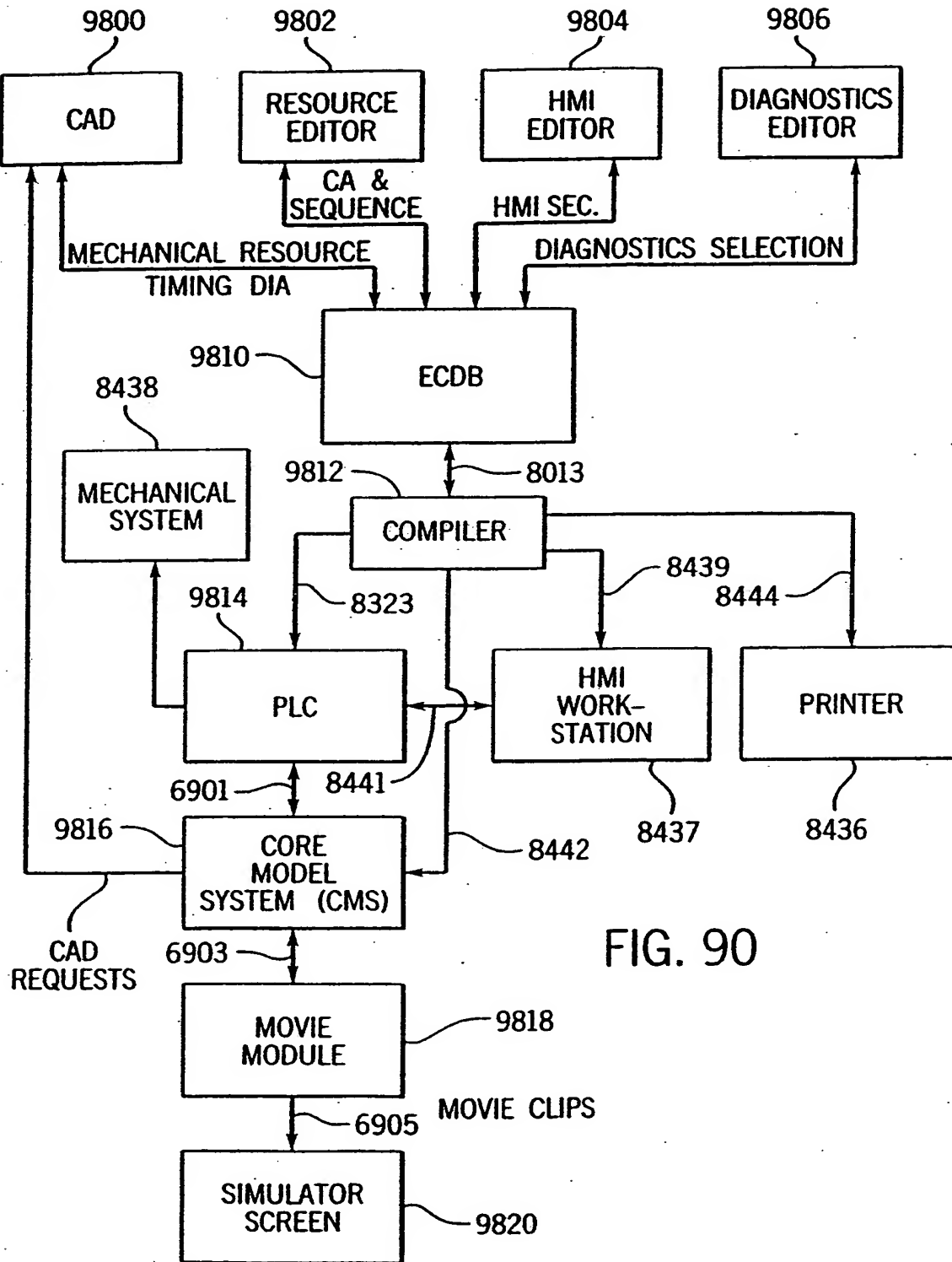


FIG. 89



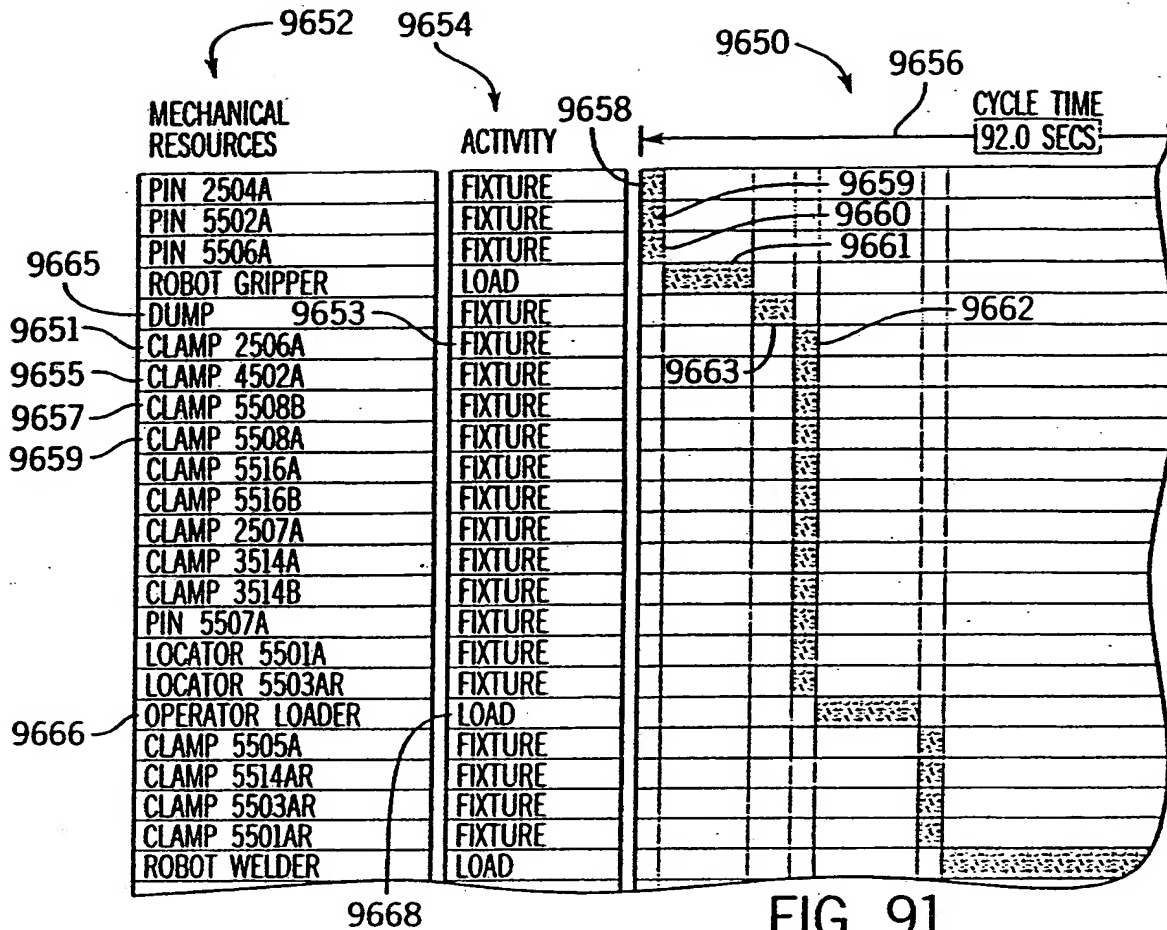


FIG. 91

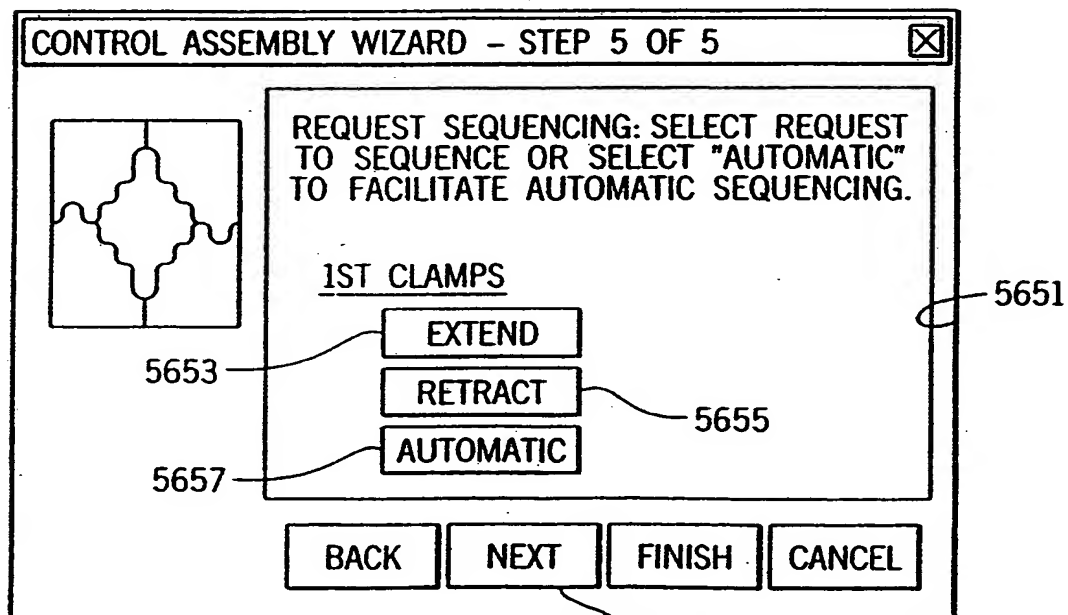


FIG. 92

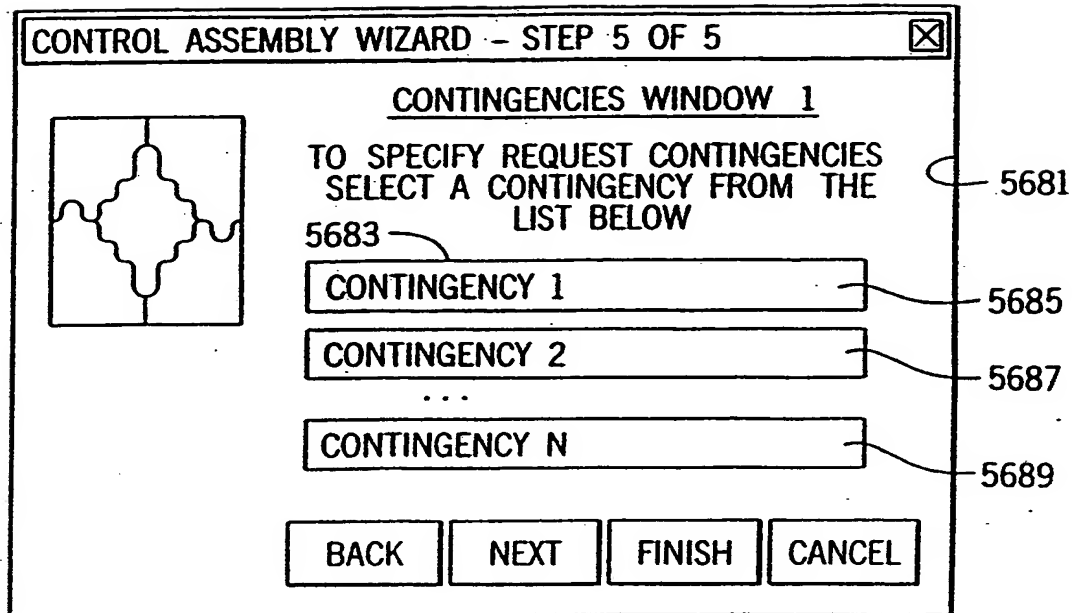


FIG. 93

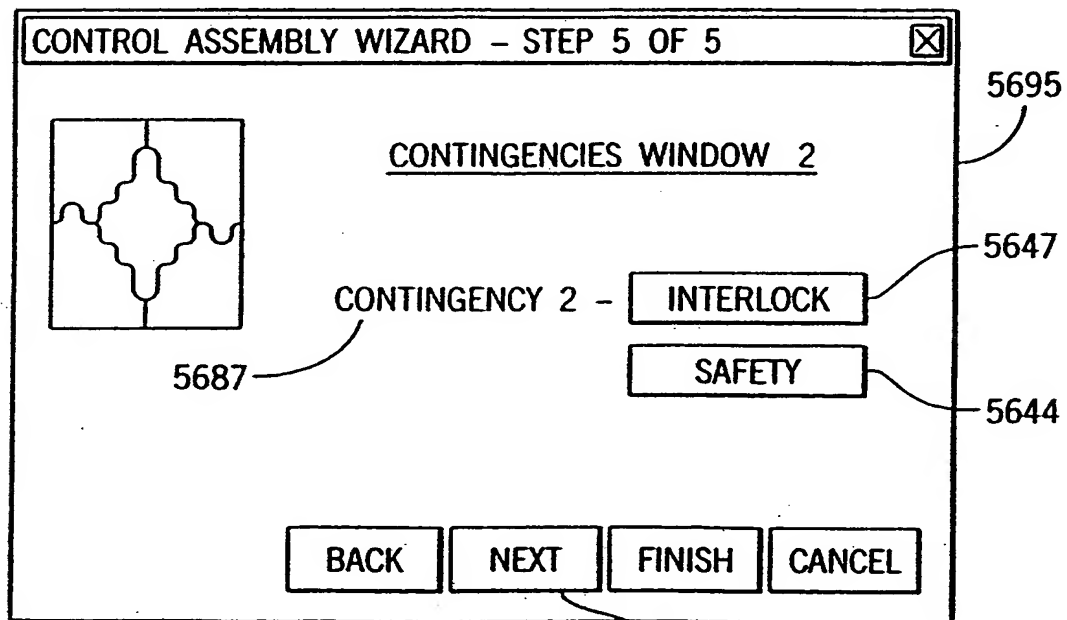


FIG. 94



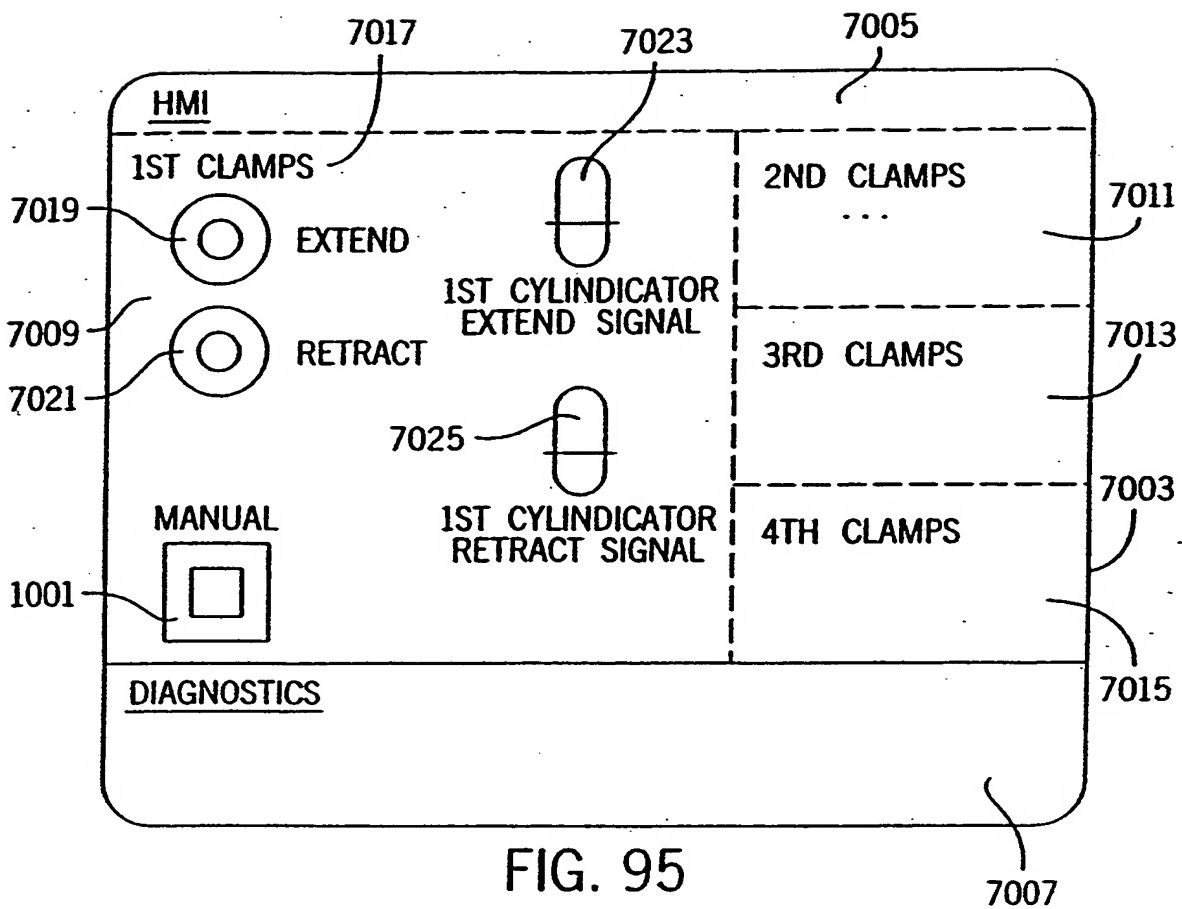


FIG. 95

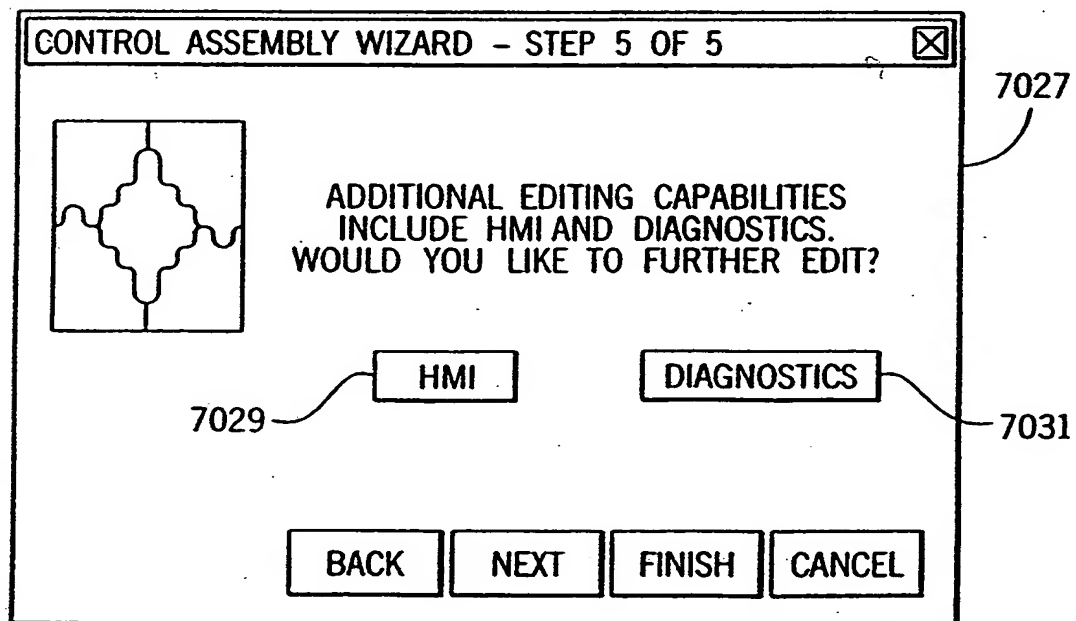


FIG. 96

HMI EDITOR:

SELECT A CA INSTANCE FROM THE LIST FOR HMI SPECIFICATION

7035

CONTROL ASSEMBLY INSTANCES

PAST - PRESENT

...

SAFE - BULKHEAD CLAMP SET 7039

1ST CLAMPS 7037

2ND CLAMPS

3RD CLAMPS

4TH CLAMPS

...

7033

BACK NEXT FINISH CANCEL

7061

FIG. 97

HMI EDITOR:

7043

1ST CLAMPS

7049	7045 MONITORABLE I/O				7047 CONTROLLABLE I/O / REQ.			
DEVICE	01	02	03	04	01	02	03	04
9421 TWO-POS. VALVE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9423 SPRING RET VALVE	05	<input type="checkbox"/>	06	<input type="checkbox"/>	05	<input type="checkbox"/>	06	<input type="checkbox"/>
9425 CYLINDICATOR-1	11	<input checked="" type="checkbox"/>	12	<input checked="" type="checkbox"/>	-	-	-	-
9427 CYLINDICATOR-2	13	<input type="checkbox"/>	14	<input type="checkbox"/>	-	-	-	-
9429 CYLINDICATOR-3	15	<input type="checkbox"/>	16	<input type="checkbox"/>	-	-	-	-
9431 CYLINDICATOR-4	17	<input type="checkbox"/>	18	<input type="checkbox"/>	-	-	-	-

7053

7051

7055

7057

EXTEND ☒

RETRACT ☒

7059

BACK NEXT FINISH CANCEL

7041

7601

FIG. 98

DIAGNOSTICS EDITOR:      SELECT A CA INSTANCE FROM THE LIST FOR DIAGNOSTICS SPECIFICATION

7103  
CONTROL ASSEMBLY INSTANCES

PAST - PRESENT  
⋮

SAFE - BULKHEAD CLAMP SET 7107

1ST CLAMPS 7105  
2ND CLAMPS  
3RD CLAMPS  
4TH CLAMPS

7101

BACK
NEXT
FINISH
CANCEL

FIG. 99

7601

DIAGNOSTICS EDITOR:

7111 1ST CLAMPS
7113
7117
7115

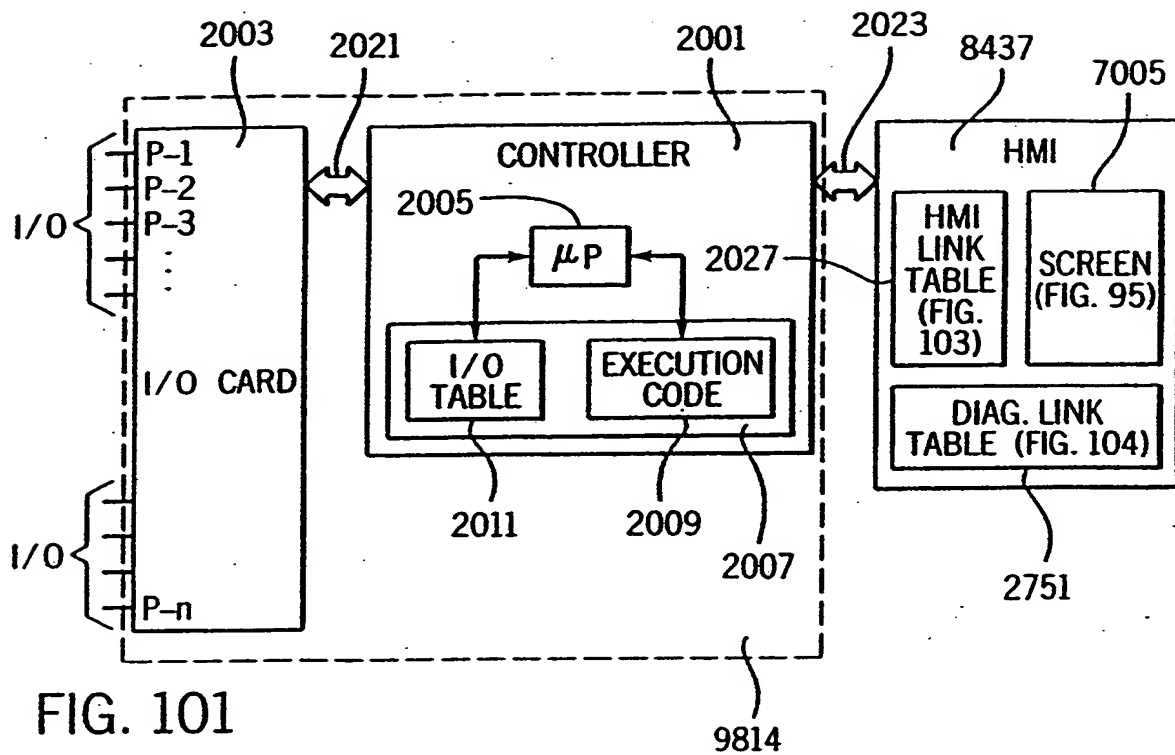
DEVICE / REQ.	REQUIREMENT		ACTIVITY
CYLINDICATOR-1	FAILURE	<input checked="" type="checkbox"/>	TEXT: "CYLINDICATOR ..."
CYLINDICATOR-2	FAILURE	<input type="checkbox"/>	TEXT: "... 7119
CYLINDICATOR-3	FAILURE	<input type="checkbox"/>	TEXT: "... 7121
CYLINDICATOR-4	FAILURE	<input type="checkbox"/>	TEXT: "... 7123
EXTEND 1ST CYLINDICATOR	I1 PASSIVE	<input checked="" type="checkbox"/>	TEXT: "SENSOR ERROR"
	7125		
RETRACT 1ST CYLINDICATOR	I2 PASSIVE	<input checked="" type="checkbox"/>	TEXT: "SENSOR ERROR"
			7127

7109

BACK
NEXT
FINISH
CANCEL

FIG. 100

7601



HMI LINKING TABLE			
CA INSTANCE	LABEL	TYPE	I/O
1ST CLAMPS	1ST CYLINDICATOR EXTEND SIGNAL	INDIC.	1ST CLAMPS I1
	1ST CYLINDICATOR RETRACT SIGNAL	INDIC.	1ST CLAMPS I2
	MANUAL	BUT.	MANUAL
	EXTEND	BUT.	1ST CLAMPS EXTEND REQUEST CONTROL
	RETRACT	BUT.	1ST CLAMPS RETRACT REQUEST CONTROL
2ND CLAMPS			
...	...	...	...

FIG. 103

2019	8037	2015	2017
PIN #	SIGNAL	STATUS	
8034	P-1	1ST CLAMPS 01	1
	P-2	1ST CLAMPS 02	1
	⋮	⋮	⋮
8043		1ST CLAMPS 06	0
8046	P-X	1ST CLAMPS 11	0
2723	⋮	1ST CLAMPS 12	⋮
8049		⋮	⋮
2137		1ST CLAMPS 18	1
2729		1ST CLAMPS EXTEND REQUEST	0
2049		1ST CLAMPS SAFETY OVERRIDE	1
2051		1ST CLAMPS SAFETY 1	0
		1ST CLAMPS SAFETY 2	⋮
2077		1ST CLAMPS INTERLOCK 1	⋮
2079		1ST CLAMPS INTERLOCK 2	⋮
		⋮	⋮
		1ST CLAMPS EXTEND SENSOR ERROR	8113
		1ST CLAMPS CYLINDER FAILURE	8048
		⋮	⋮
		1ST CLAMPS EXTEND DONE	2727
2131		MANUAL	⋮
2133		1ST CLAMPS 01 CONTROL	⋮
		⋮	⋮
2725		1ST CLAMPS 06 CONTROL	⋮
	P-Y	1ST CLAMPS EXTEND REQUEST CONTROL	⋮
2135		1ST CLAMPS RETRACT REQUEST CONTROL	⋮
2136	⋮	⋮	⋮

FIG. 102

LINK TO	ACTIVITY
1ST CLAMPS EXTEND SENSOR ERROR	TEXT: "CYLINDICATOR SENSOR FAILURE"
1ST CLAMPS CYLINDER FAILURE	TEXT: "EXTENSION NOT CONFIRMED"
⋮	⋮

FIG. 104

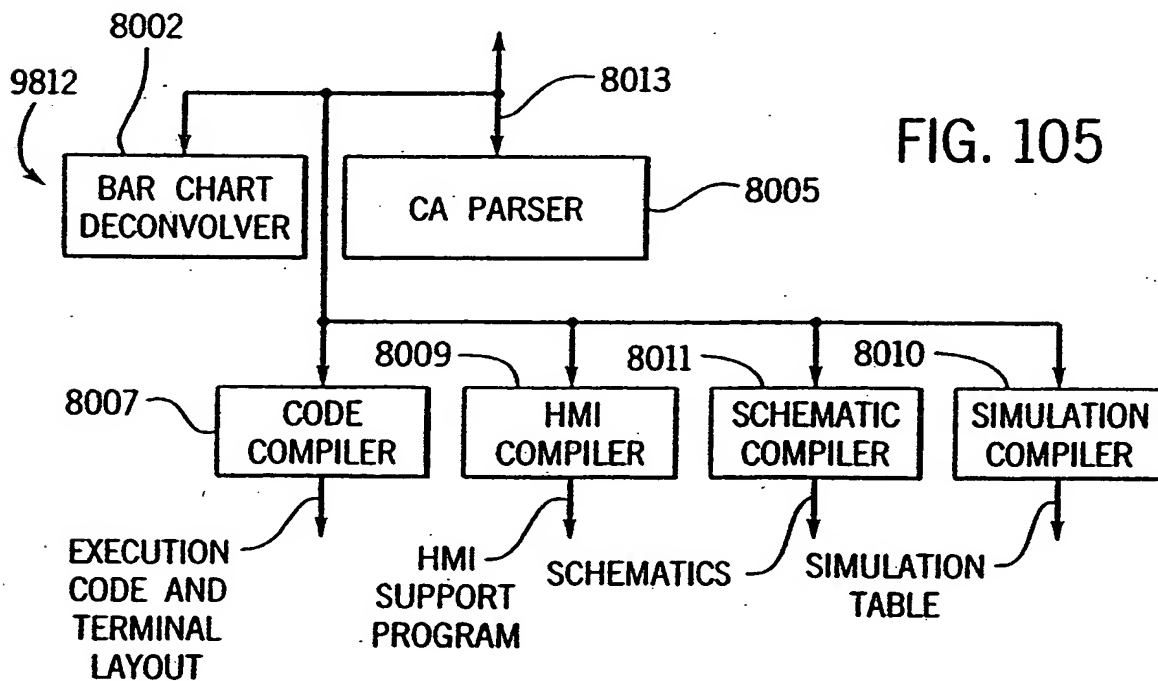


FIG. 105

8021

CODE BUILDING TABLE																		
8023 CA TYPE / REQUEST	8025 CODE SEGMENT	8026 CODE I/O	8027 PARAMETERIZING RULE SET (PRS)															
PART-PRESENT	...	...	... 8201 8207															
NACHISA160-CONT.	...	...	8203 ... 8205 8221															
SAFE BULK HEAD CLAMPS EXTEND 8029 8033	<div style="border: 1px solid black; padding: 2px; text-align: center;">CODE</div> <div style="margin-top: 10px;">8032</div> <div style="margin-top: 10px;">8060</div> <div style="margin-top: 10px;">2731</div>	<div style="border: 1px solid black; padding: 2px; text-align: center;">PLC I/O TABLE SEGM.</div> <div style="margin-top: 10px;">8209</div>	<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 33%; text-align: left; padding: 2px;">PARAMETER</th><th style="width: 33%; text-align: left; padding: 2px;">CODE MODIFICATION</th><th style="width: 33%; text-align: left; padding: 2px;">PLC I/O TABLE MODIFICATIONS</th></tr></thead><tbody><tr><td style="padding: 2px;">FLAGGED BOX 9480a</td><td style="padding: 2px;">CLOSE SWITCHES S3 AND S4</td><td style="padding: 2px;">ADD 05; 06</td></tr><tr><td style="padding: 2px;">FLAGGED BOX 9490</td><td style="padding: 2px;">CLOSE SWITCH S-14</td><td style="padding: 2px;">ADD 1ST CLAMPS EXTEND REQUEST CONTROL</td></tr><tr><td style="text-align: center; padding: 2px;">⋮</td><td style="text-align: center; padding: 2px;">8215 : 8217</td><td style="text-align: center; padding: 2px;">⋮</td></tr><tr><td colspan="2" style="border-top: 1px solid black; height: 10px;"></td><td style="text-align: center; padding: 2px;">8301</td></tr></tbody></table>	PARAMETER	CODE MODIFICATION	PLC I/O TABLE MODIFICATIONS	FLAGGED BOX 9480a	CLOSE SWITCHES S3 AND S4	ADD 05; 06	FLAGGED BOX 9490	CLOSE SWITCH S-14	ADD 1ST CLAMPS EXTEND REQUEST CONTROL	⋮	8215 : 8217	⋮			8301
PARAMETER	CODE MODIFICATION	PLC I/O TABLE MODIFICATIONS																
FLAGGED BOX 9480a	CLOSE SWITCHES S3 AND S4	ADD 05; 06																
FLAGGED BOX 9490	CLOSE SWITCH S-14	ADD 1ST CLAMPS EXTEND REQUEST CONTROL																
⋮	8215 : 8217	⋮																
		8301																
8035 -RETRACT	<div style="border: 1px solid black; padding: 2px; text-align: center;">CODE</div> <div style="margin-top: 10px;">8034</div>		<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 33%; text-align: left; padding: 2px;">PARAMETER</th><th style="width: 33%; text-align: left; padding: 2px;">CODE MODIFICATION</th><th style="width: 33%; text-align: left; padding: 2px;">PLC I/O TABLE MODIFICATIONS</th></tr></thead><tbody><tr><td colspan="3" style="border-top: 1px solid black; height: 10px;"></td></tr></tbody></table>	PARAMETER	CODE MODIFICATION	PLC I/O TABLE MODIFICATIONS												
PARAMETER	CODE MODIFICATION	PLC I/O TABLE MODIFICATIONS																
8038 -MANUAL	<div style="border: 1px solid black; padding: 2px; text-align: center;">CODE</div>		<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 33%; text-align: left; padding: 2px;">PARAMETER</th><th style="width: 33%; text-align: left; padding: 2px;">CODE MODIFICATION</th><th style="width: 33%; text-align: left; padding: 2px;">PLC I/O TABLE MODIFICATIONS</th></tr></thead><tbody><tr><td colspan="3" style="border-top: 1px solid black; height: 10px;"></td></tr></tbody></table>	PARAMETER	CODE MODIFICATION	PLC I/O TABLE MODIFICATIONS												
PARAMETER	CODE MODIFICATION	PLC I/O TABLE MODIFICATIONS																
8012 PINSET	...		... 8303															
LOCATOR SET	...																	
⋮	⋮		⋮															

FIG. 106

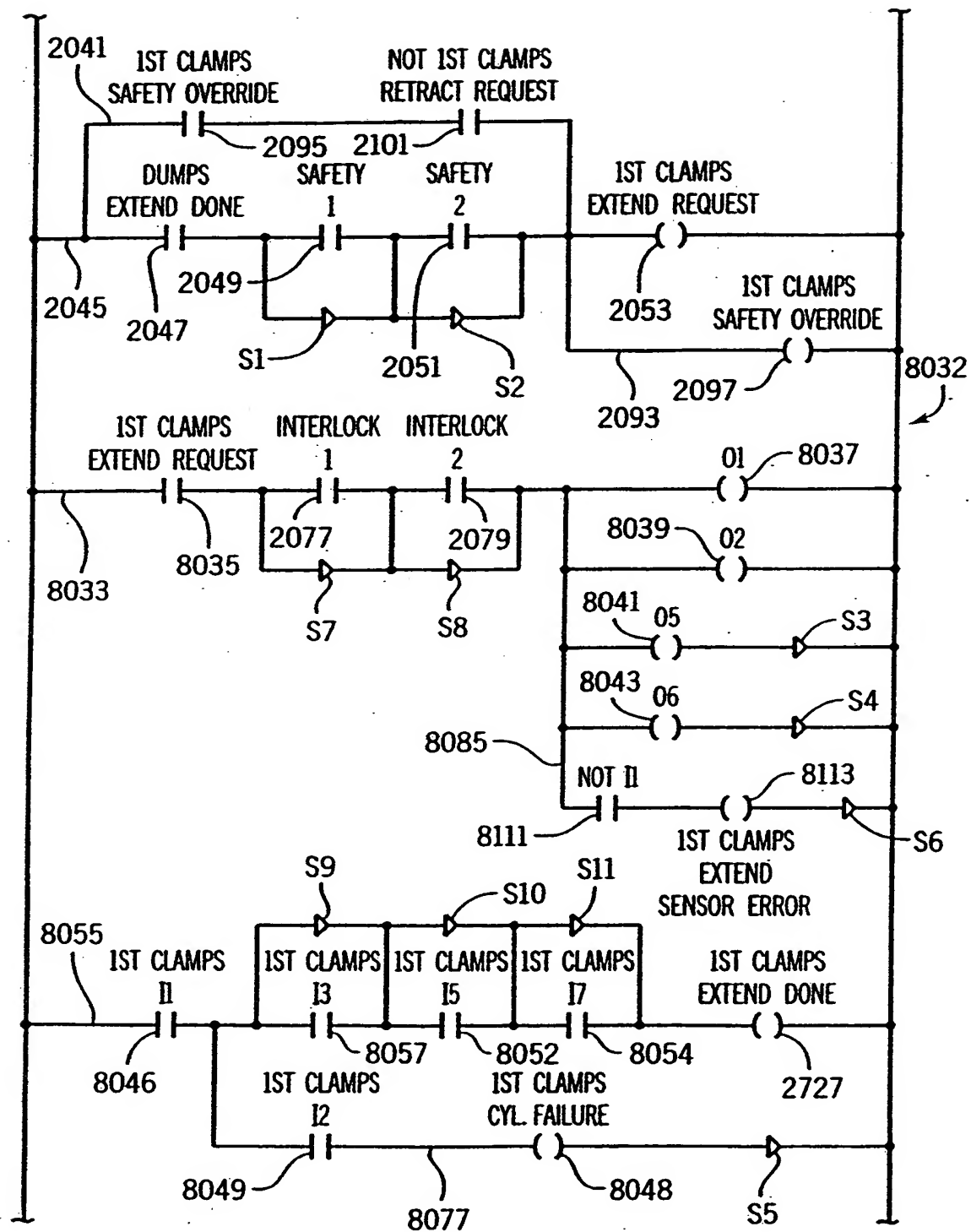


FIG. 107



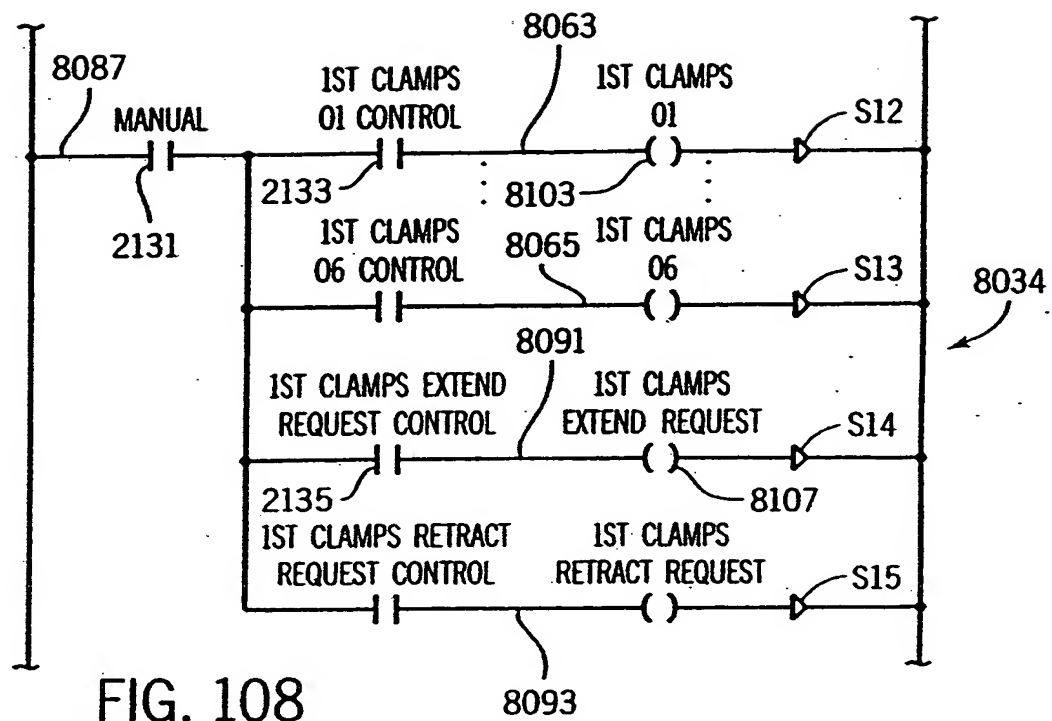


FIG. 108

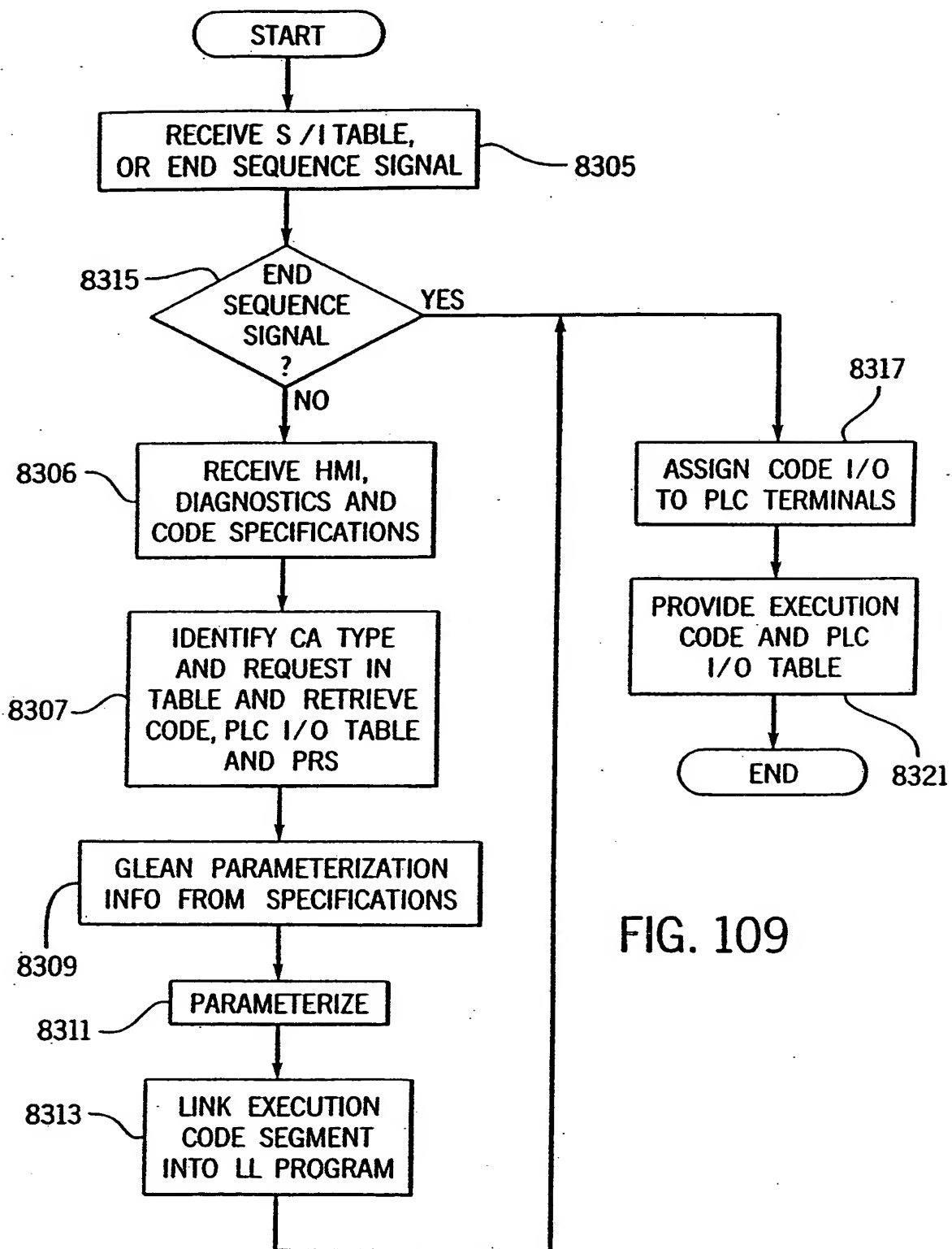


FIG. 109

8401

HMI BUILDING TABLE						
8403 CA TYPE	8411 MONITORABLE (INDICATORS)			8417 CONTROLLABLE (BUTTONS)		
	I/O	LABEL	LINK TO	I/O REQ	LABEL	LINK TO
PART-PRESENT	...	...		...	...	
NACHISA 160-CONT.	...	...		...	...	
8029 SAFE BULK HEAD CLAMP SET	01	2-POSITION VALVE HOT EXTEND OUTPUT	"NAME" 01	01	2-POSITION VALVE HOT EXTEND	"NAME" 01 CONTROL
	02	2-POSITION VALVE COMMON EXTEND OUTPUT	"NAME" 02	02	2-POSITION VALVE COMMON EXTEND	"NAME" 02 CONTROL
	...	...	...	...	...	...
	I1	1ST CYLINDRICATOR EXTEND SIGNAL	"NAME" I1	EXTEND	EXTEND	"NAME" EXTEND REQUEST CONTROL
	I2	1ST CYLINDRICATOR RETRACT SIGNAL	"NAME" I2	RETRACT	RETRACT	"NAME" RETRACT REQUEST CONTROL
	...	...	...	...	...	...
PIN-SET	...					
...	...	...		...	...	

FIG. 110

DIAGNOSTICS BUILDING TABLE		
REQUIREMENT	TEXT	LINK TO
1ST CLAMPS CYLINDER FAILURE ⋮	"CYLINDICATOR SENSOR FAILURE"	8517
1ST CLAMPS II PASSIVE	"EXTENSION NOT CONFIRMED"	

FIG. 111

SIMULATION BUILDING TABLE		
CA TYPE	PARAMETERIZATION	MODIFICATION
SAFE BULKHEAD CLAMPSET	CLEAR BOX 9482d	DELETE TABLE 9303
	CLEAR BOX 9480e	DELETE COMBINATION 9320
	⋮	⋮
PINSET	⋮	⋮

FIG. 115

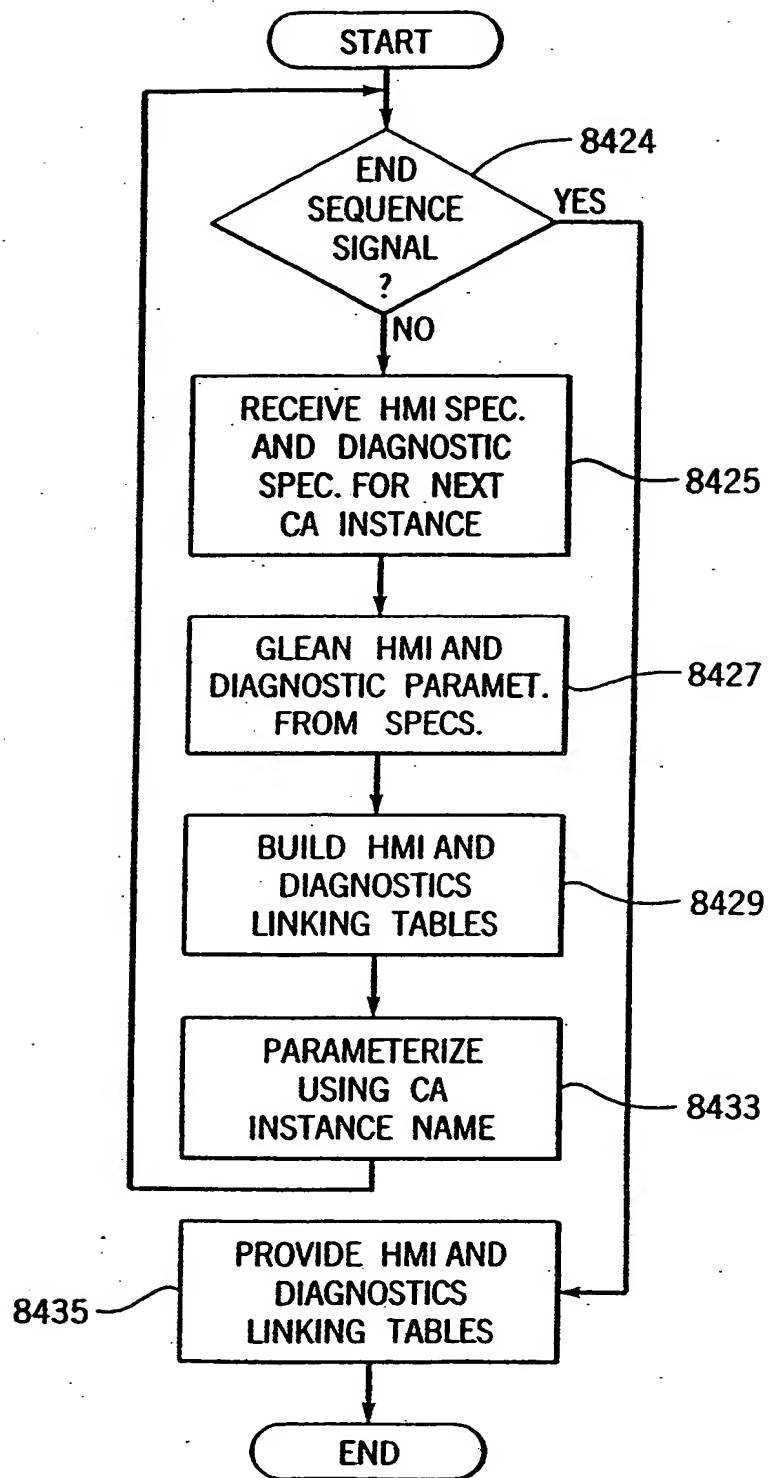


FIG. 112

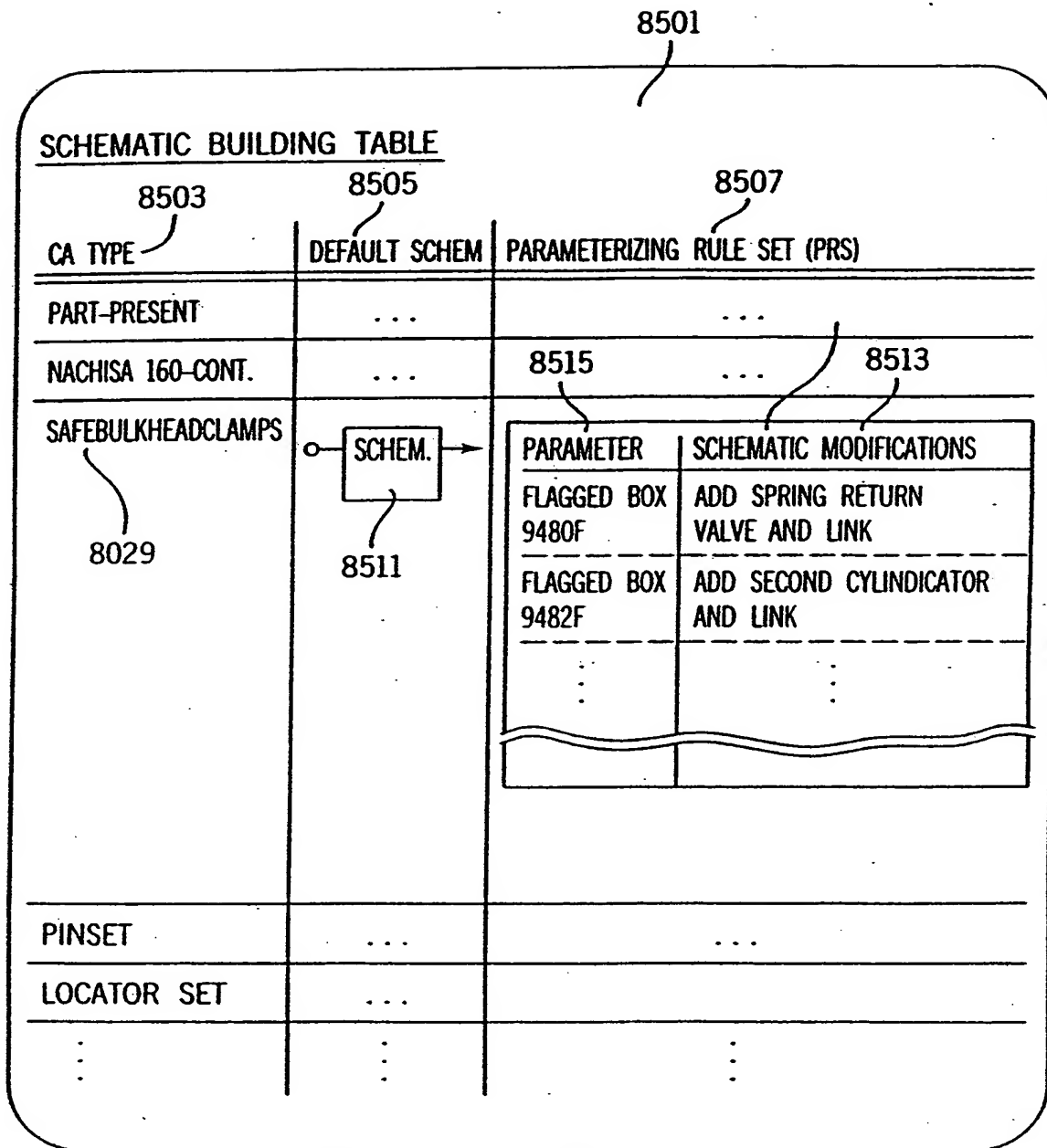
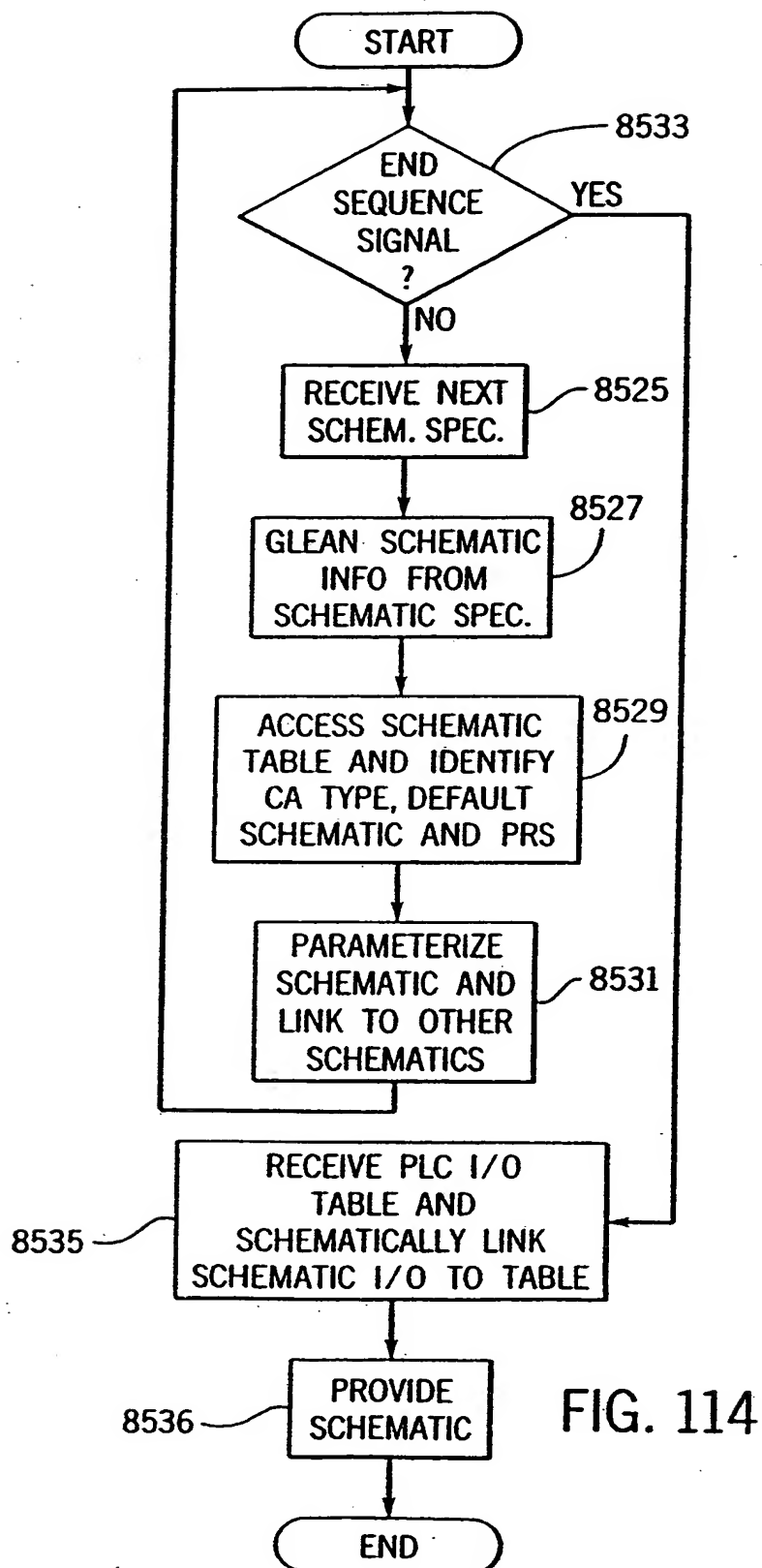


FIG. 113



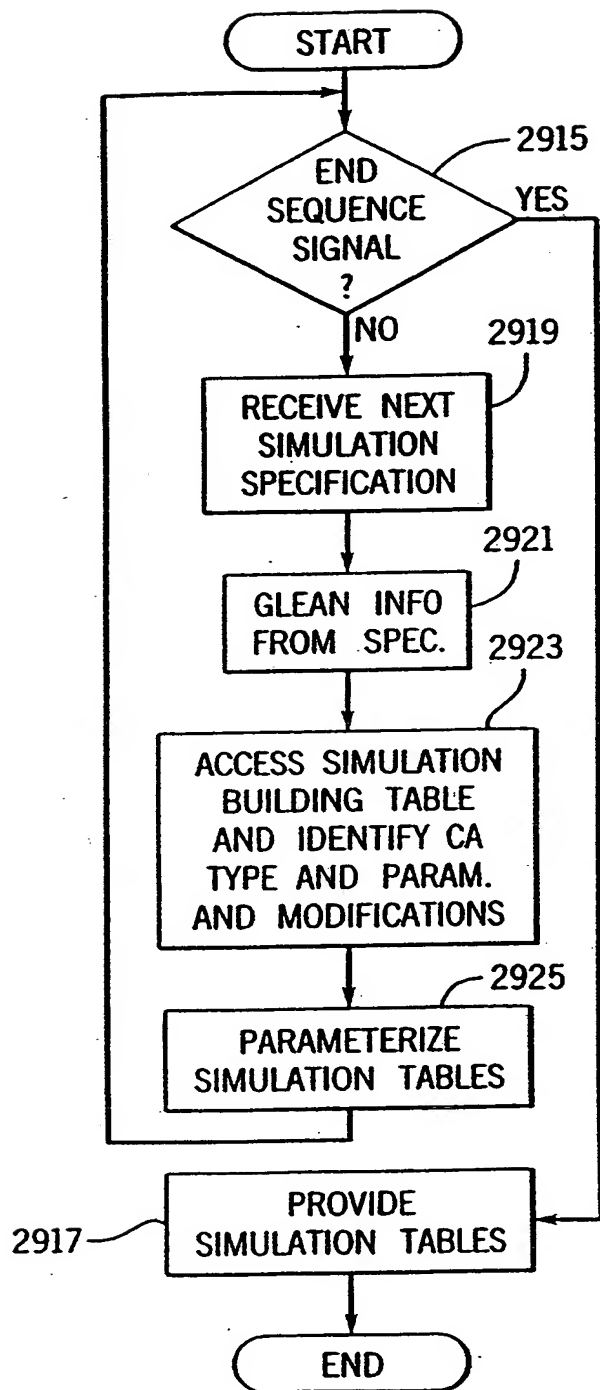


FIG. 116



FIG. 117

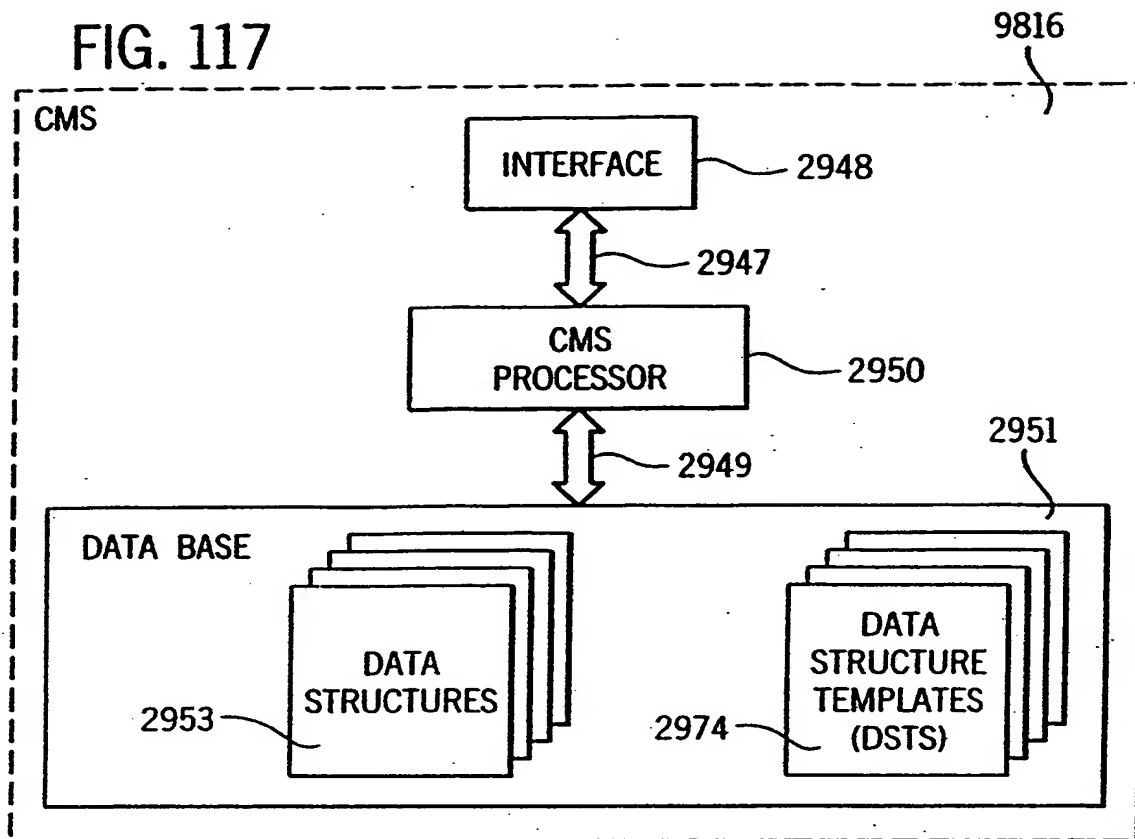
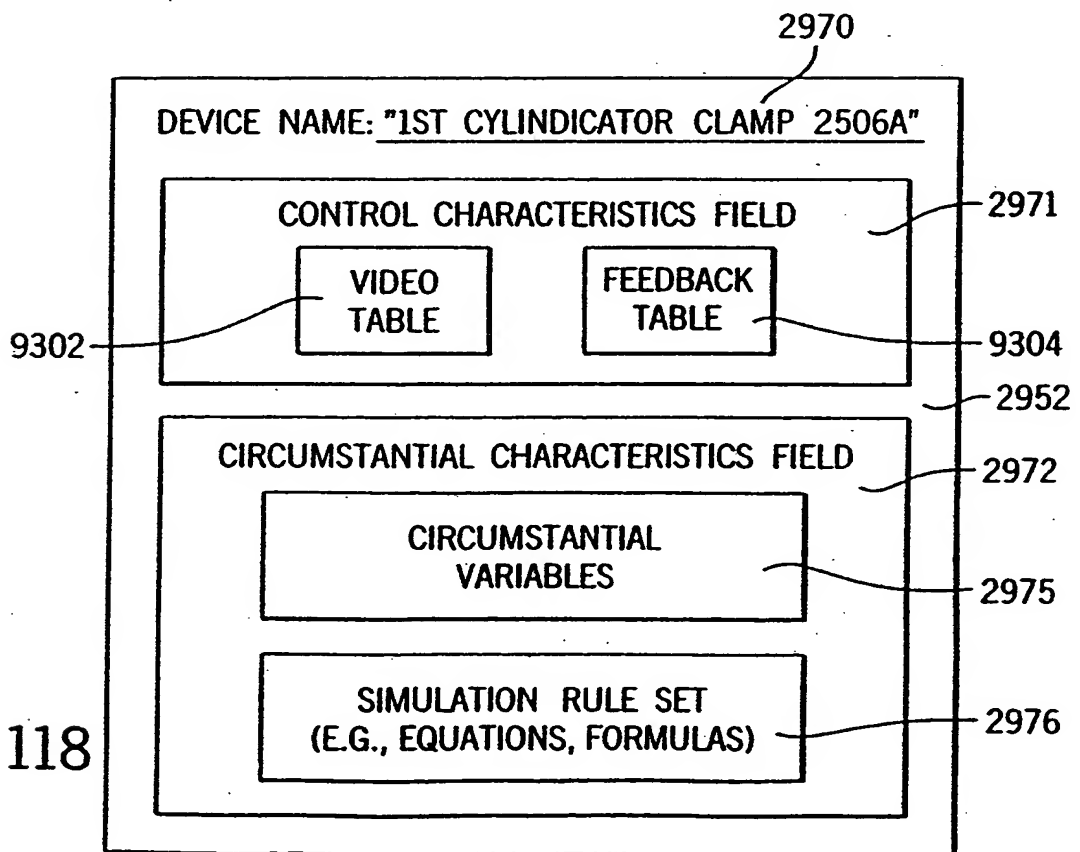
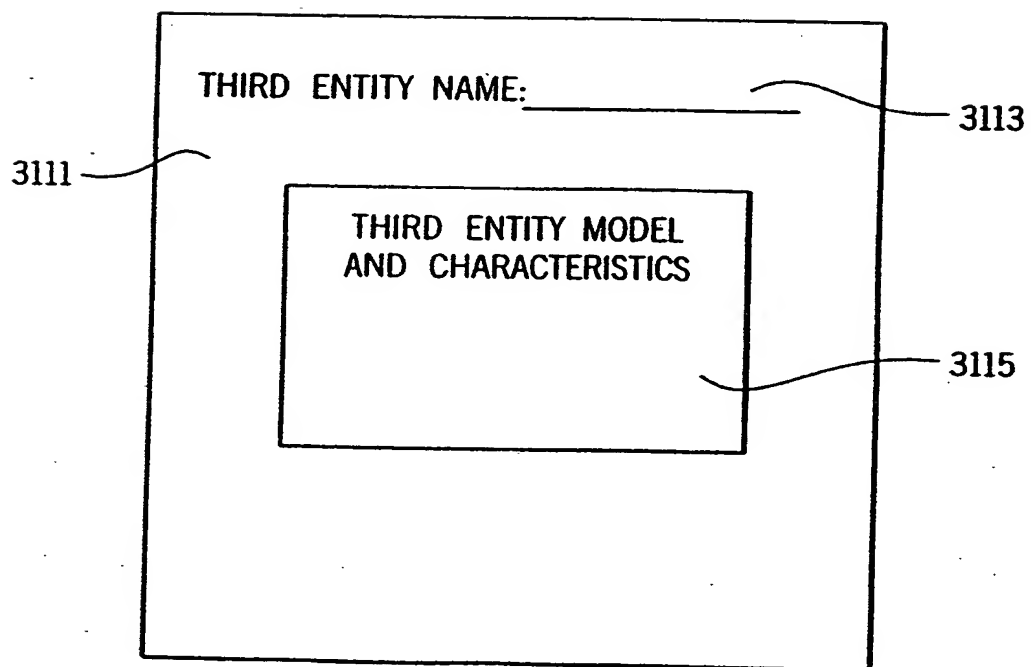
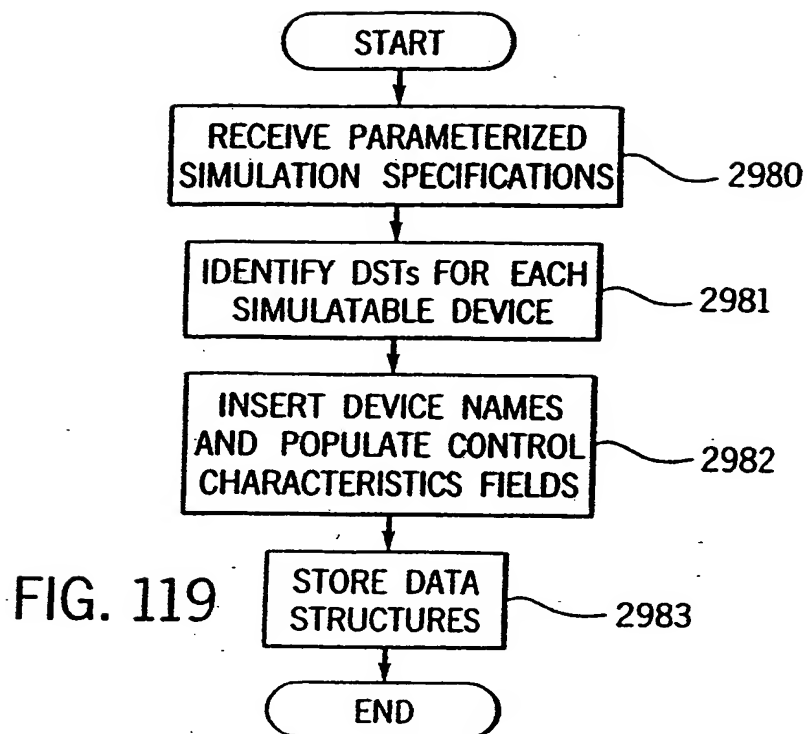


FIG. 118





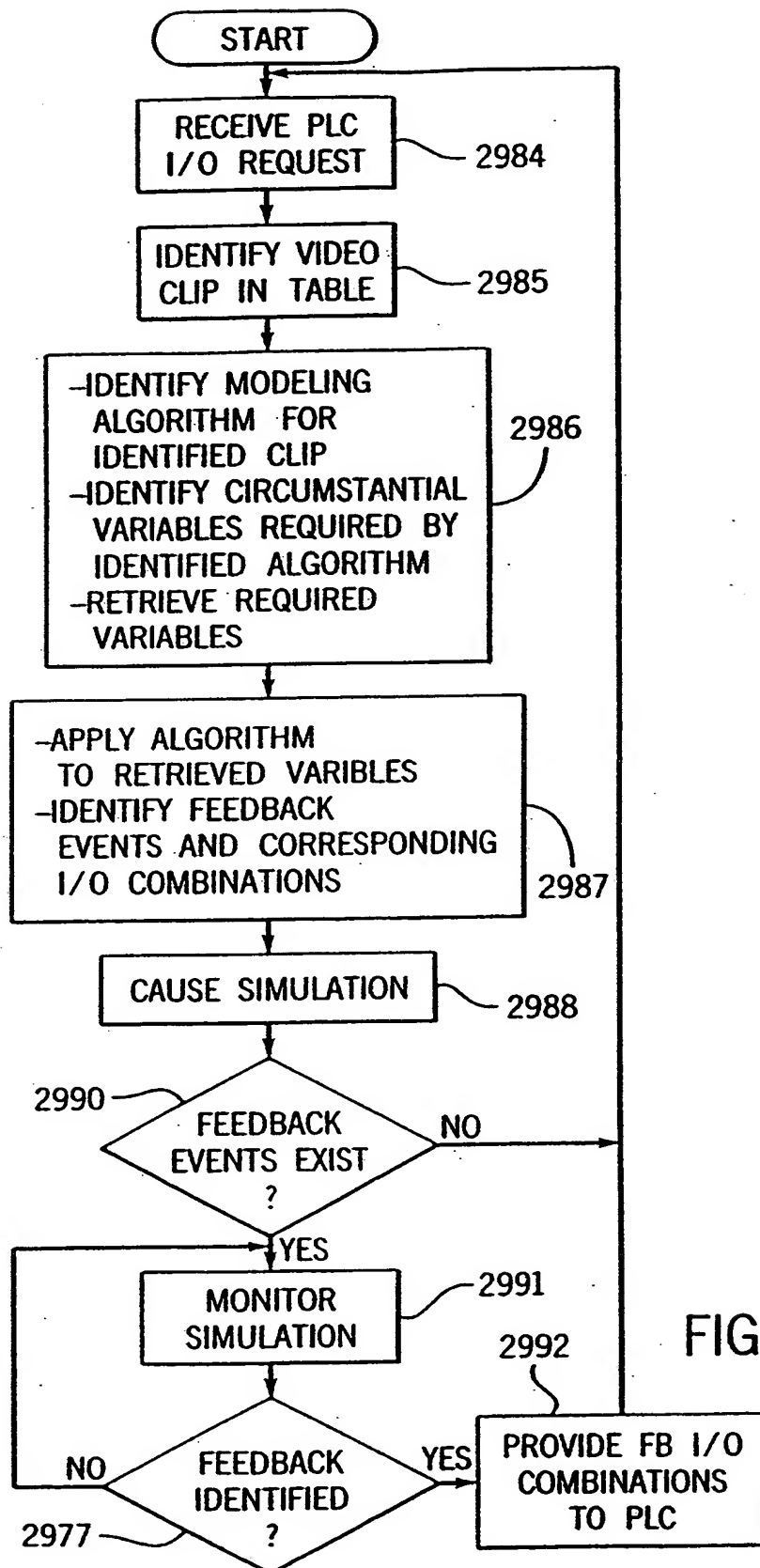
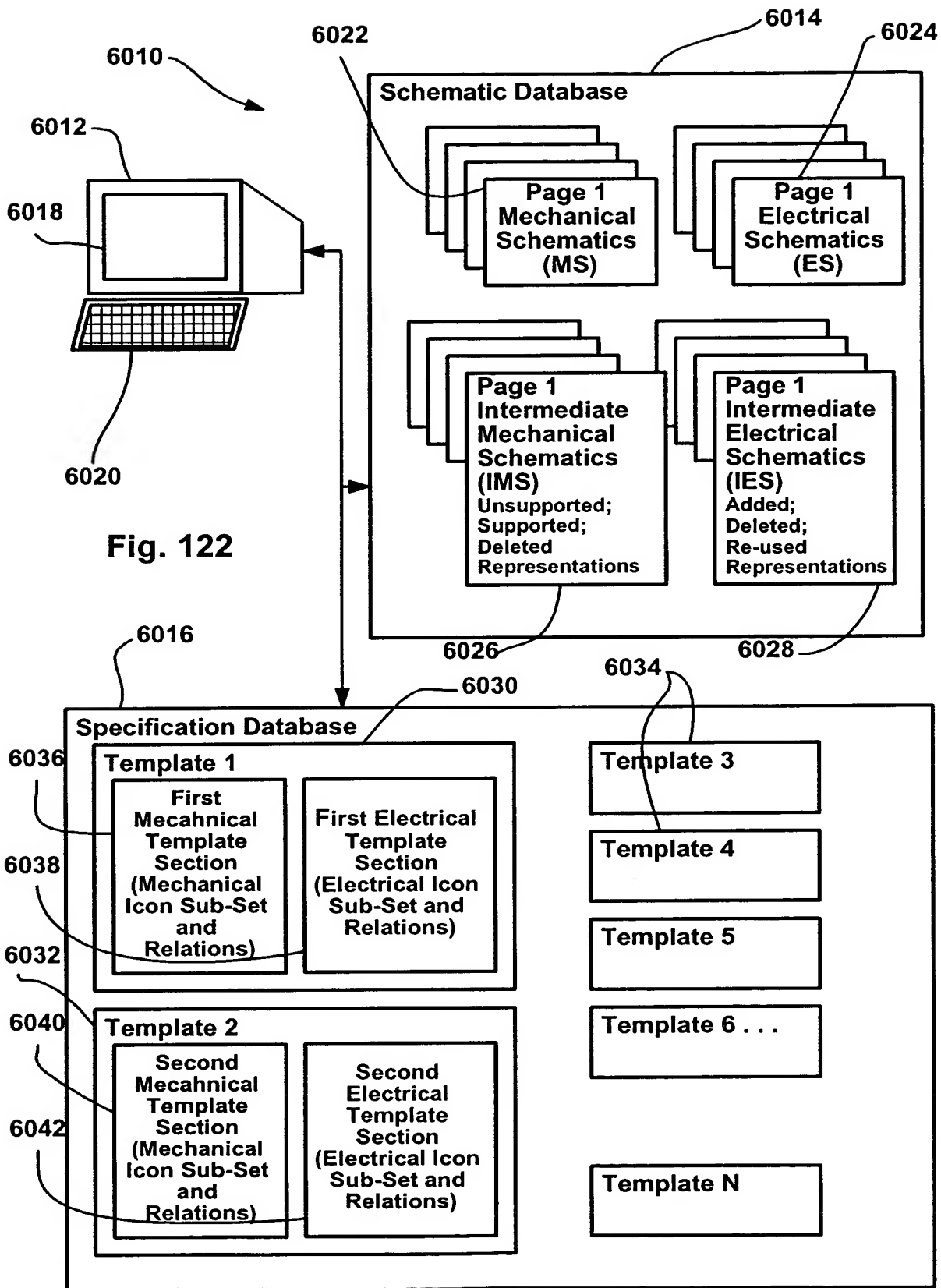
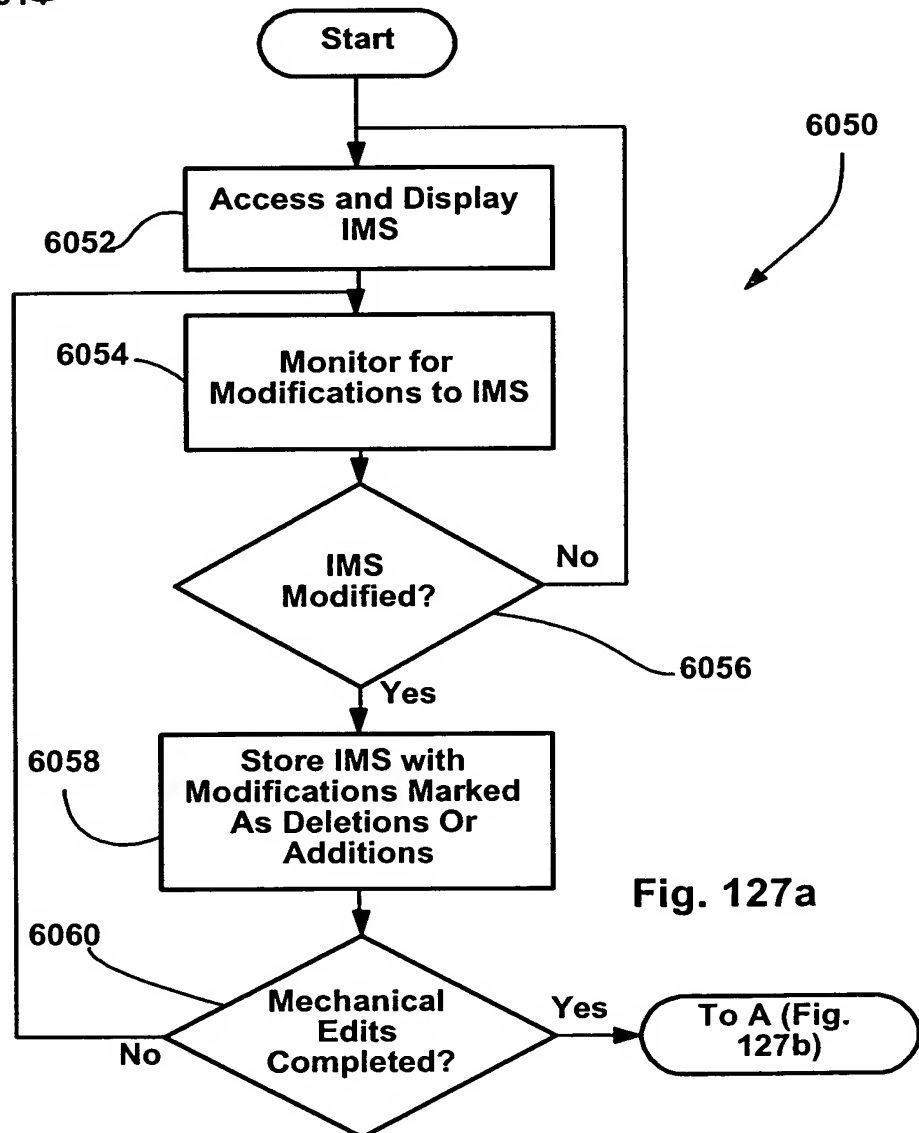
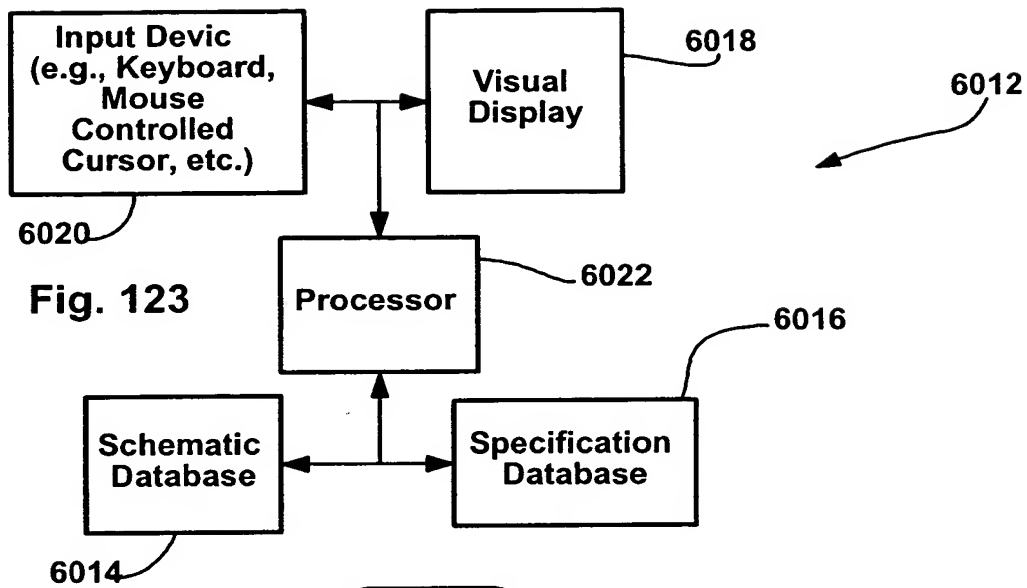
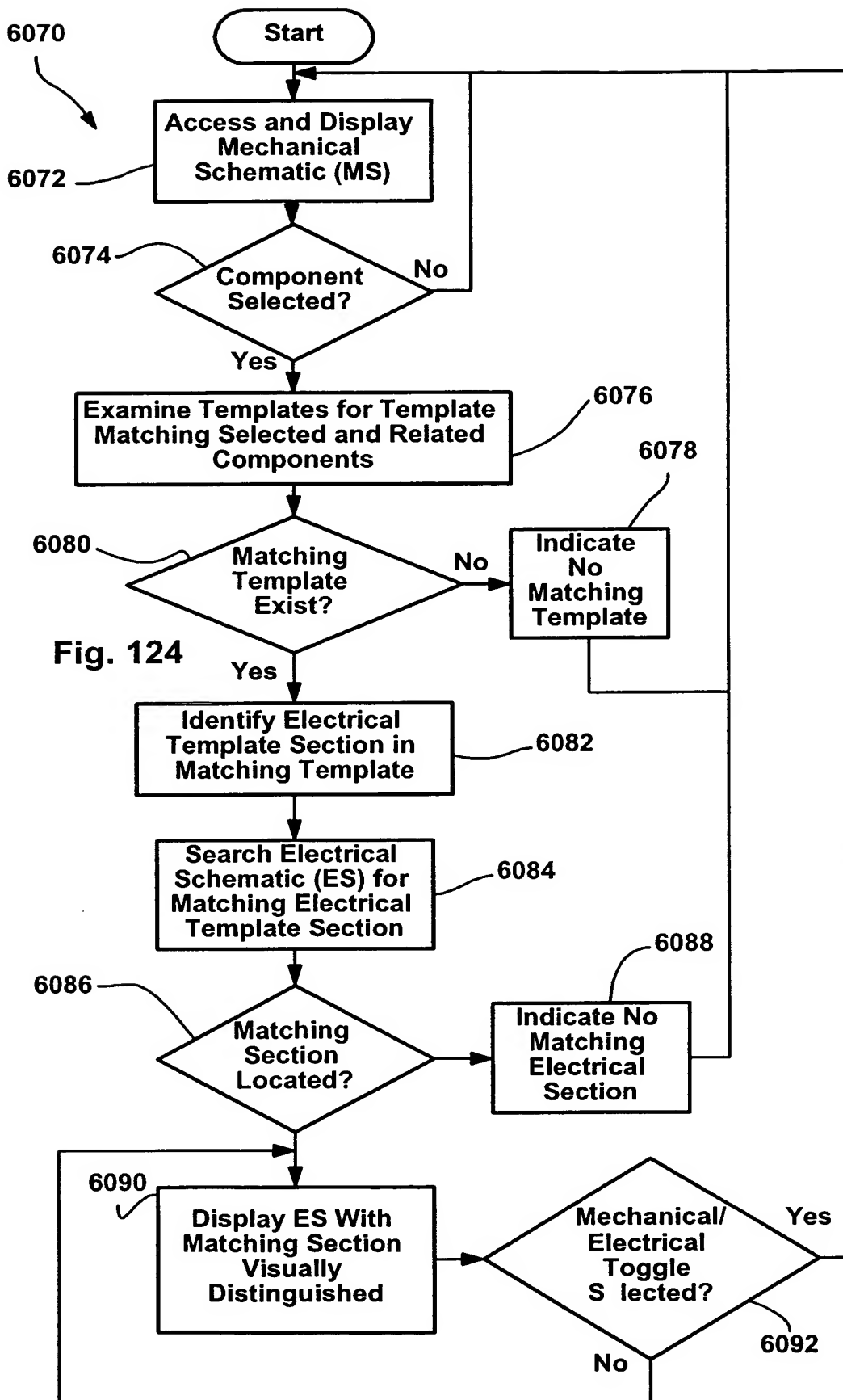
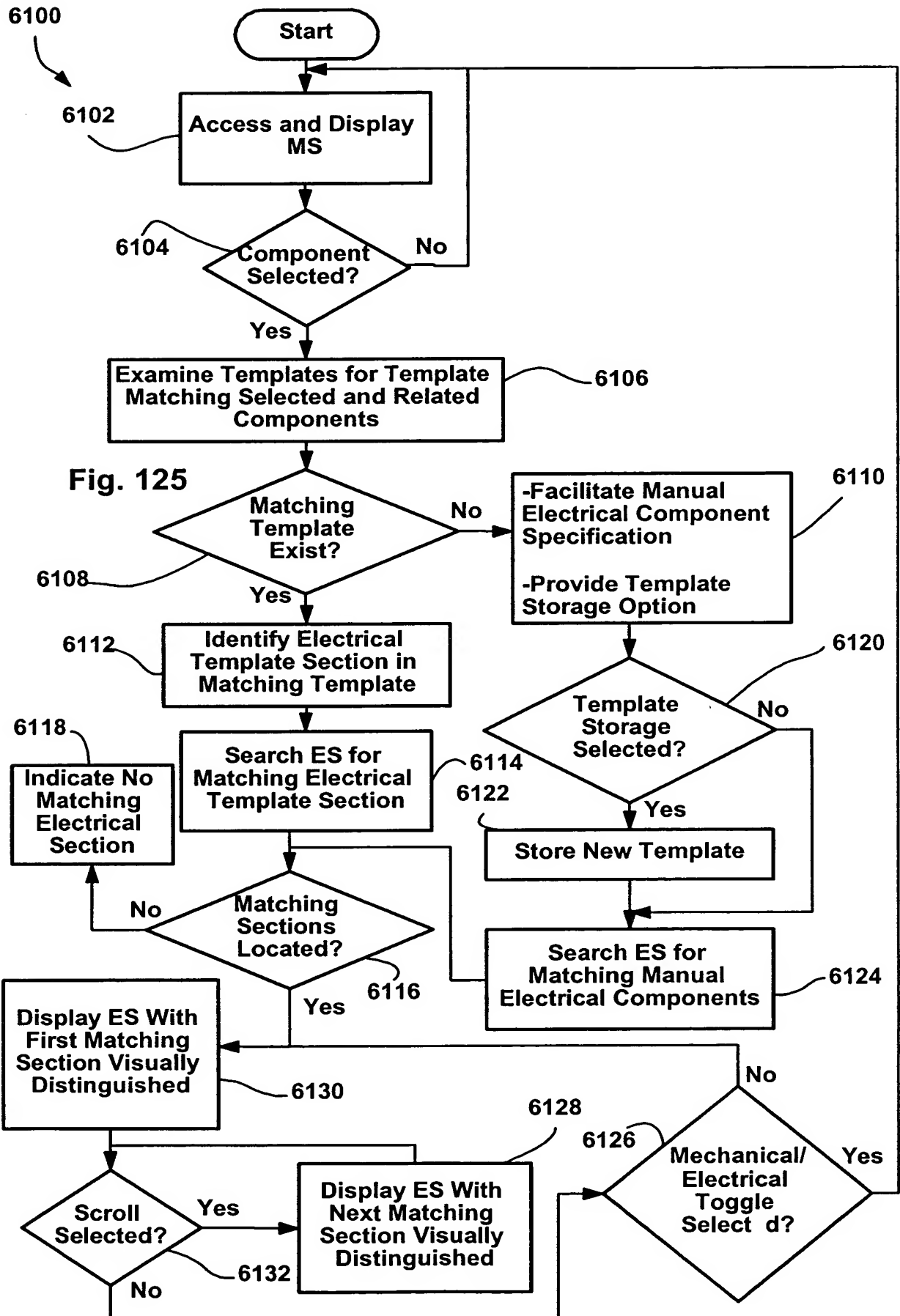


FIG. 120









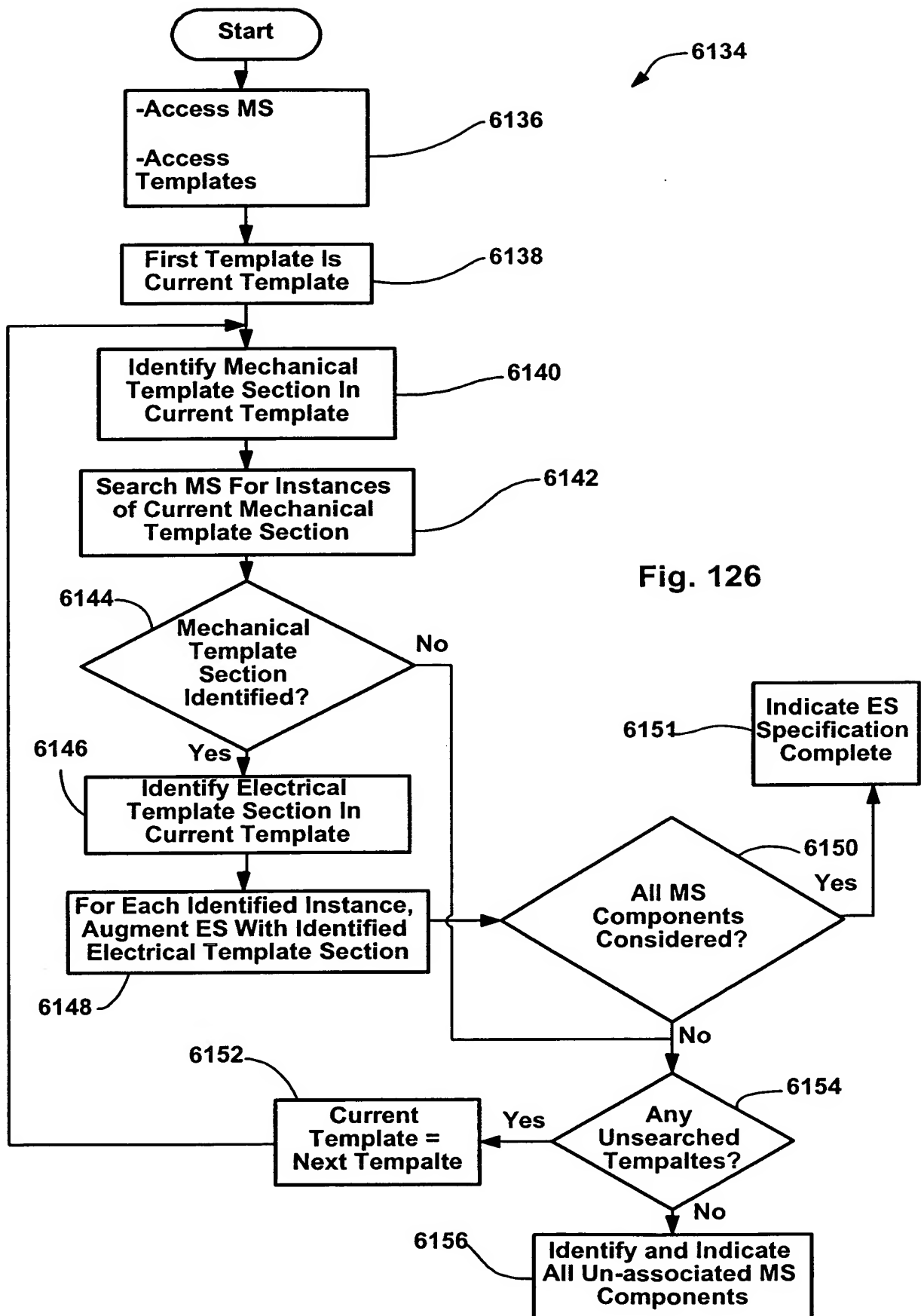
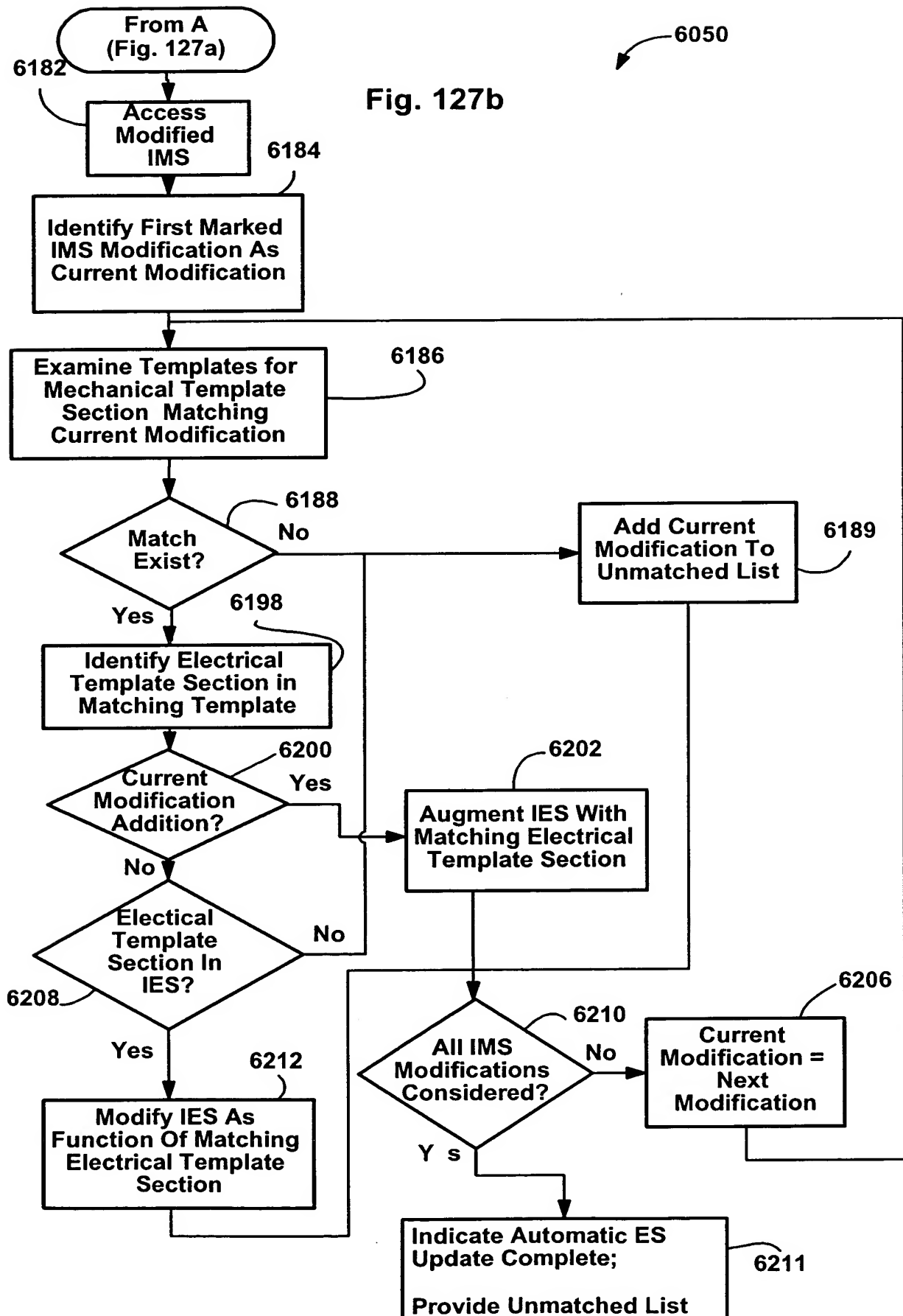


Fig. 126





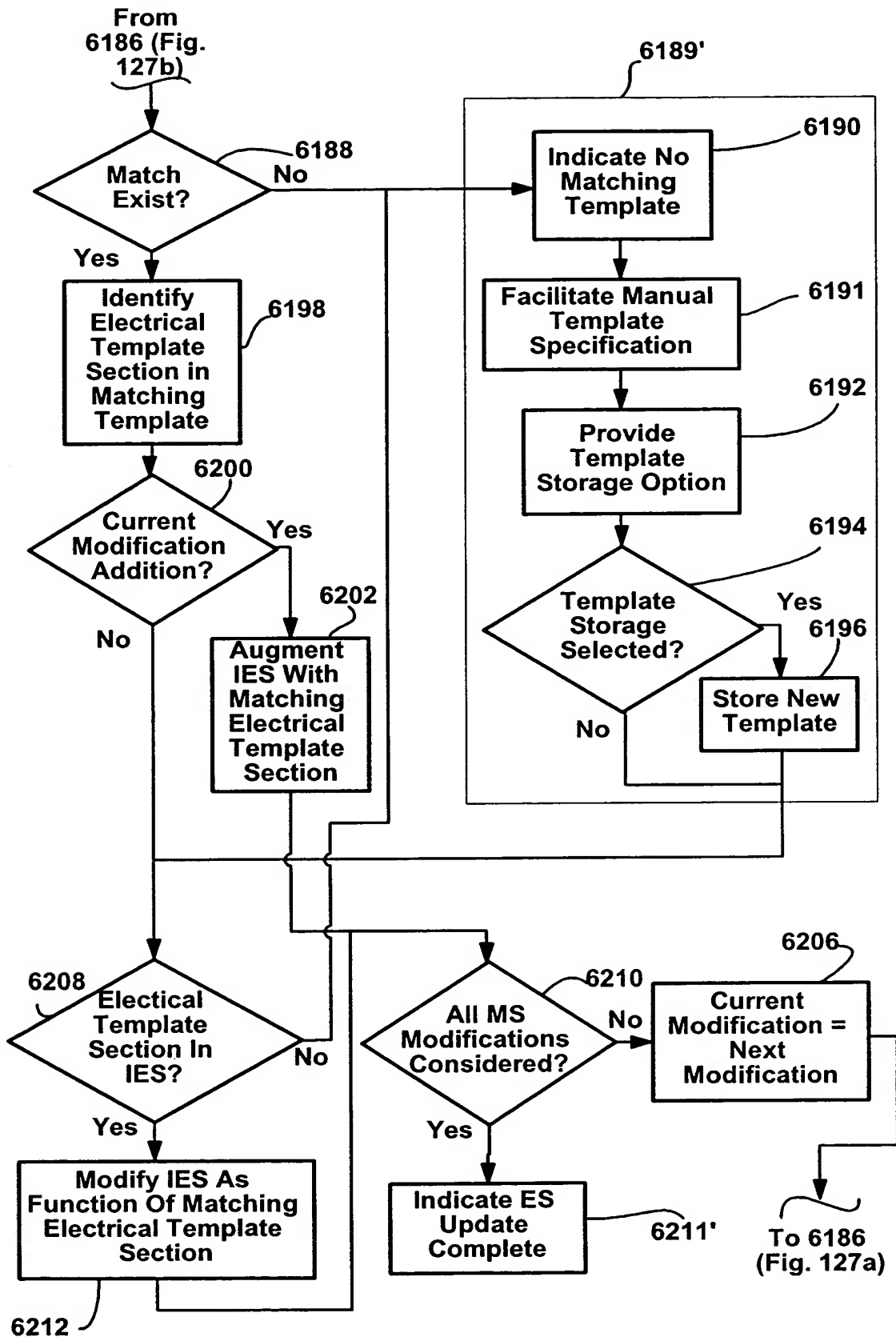
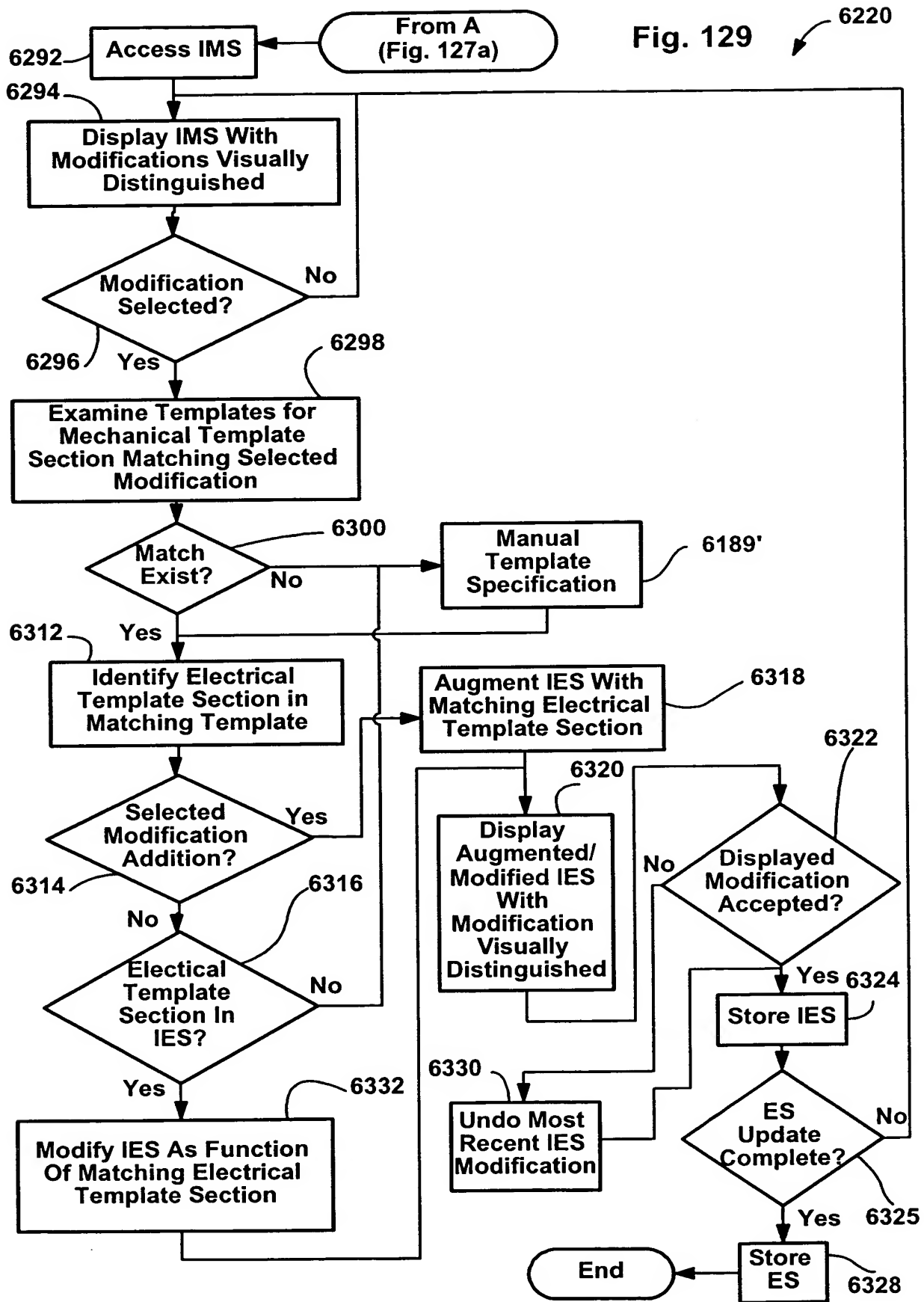
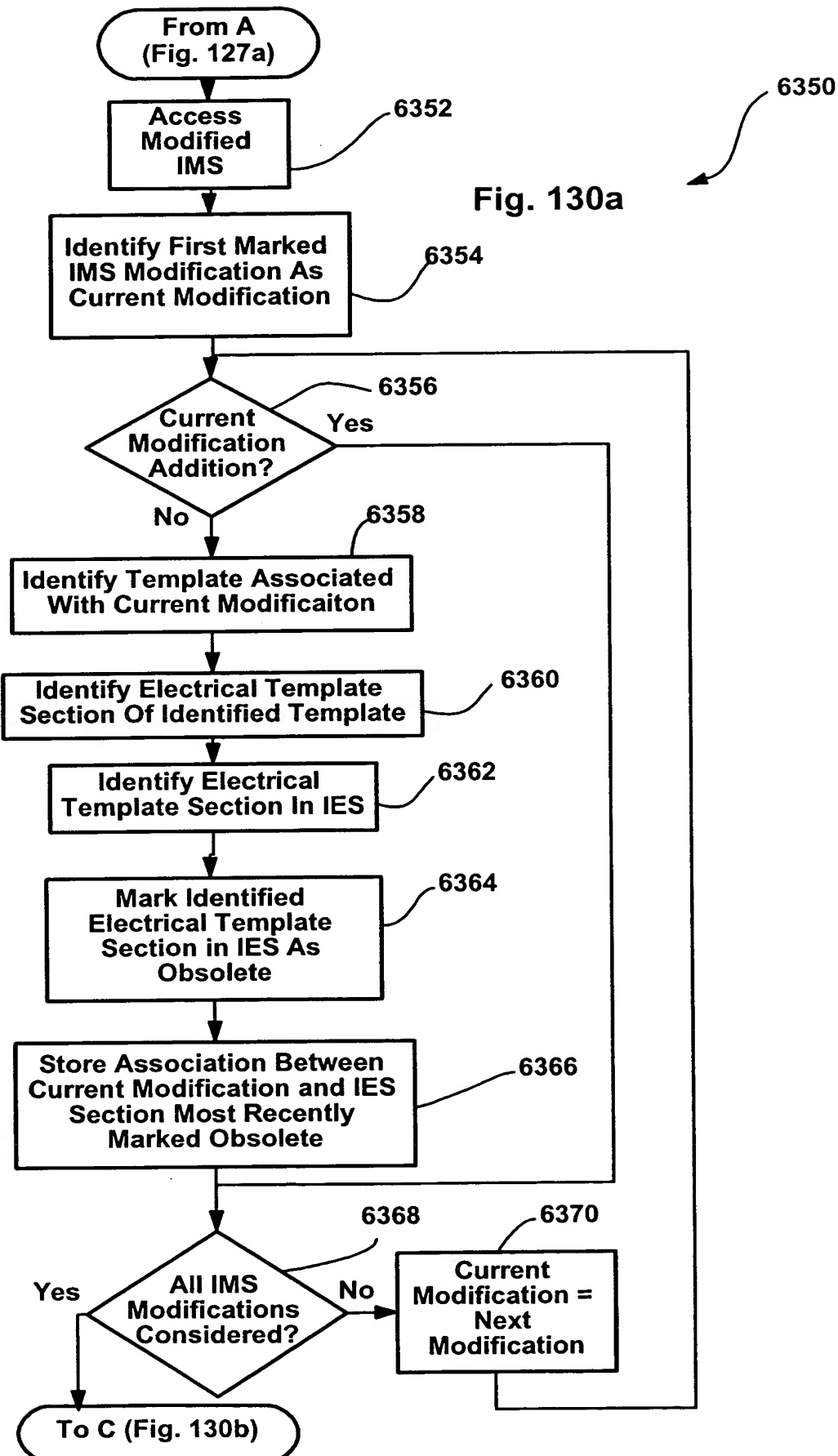
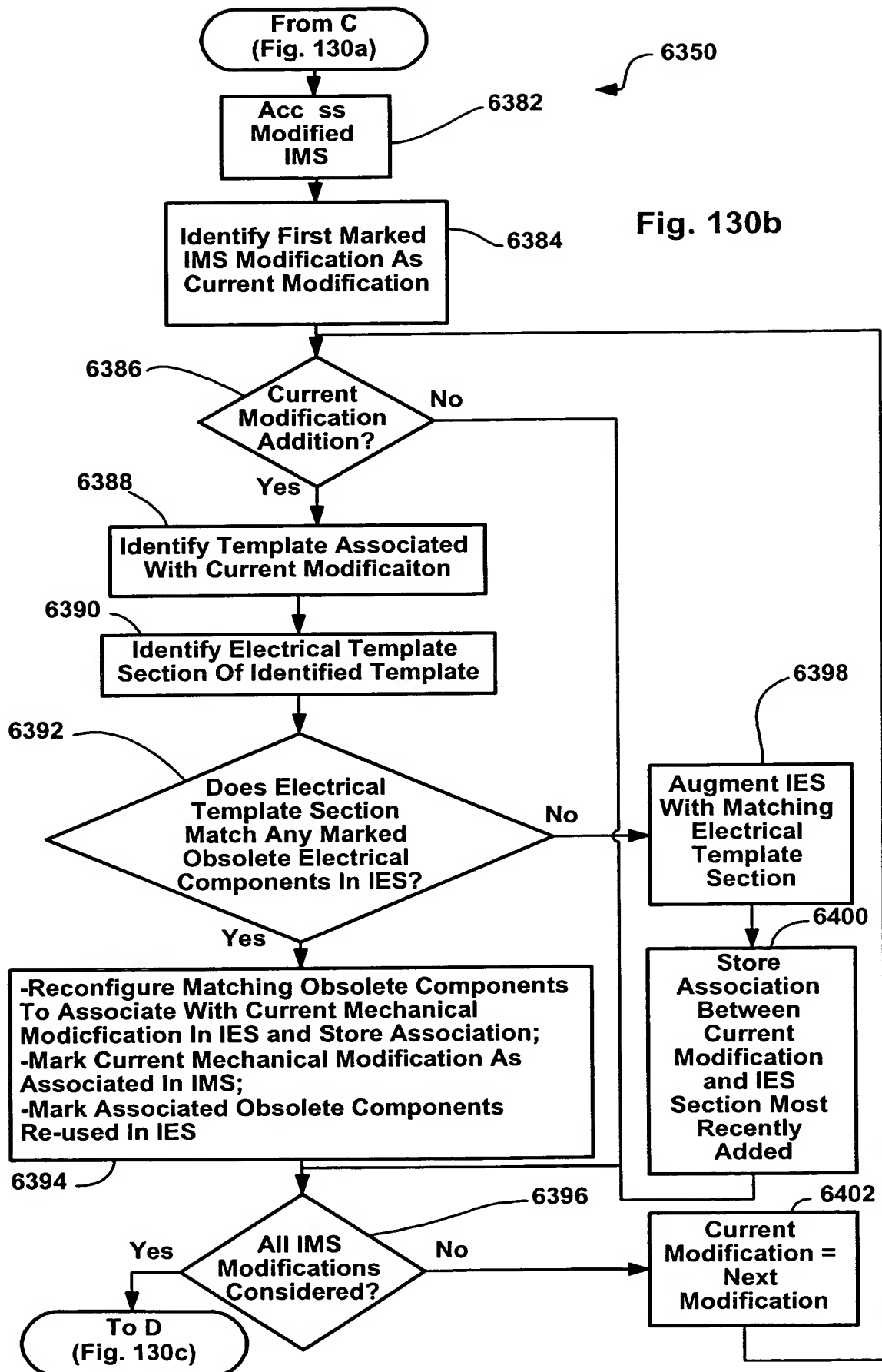


Fig. 128







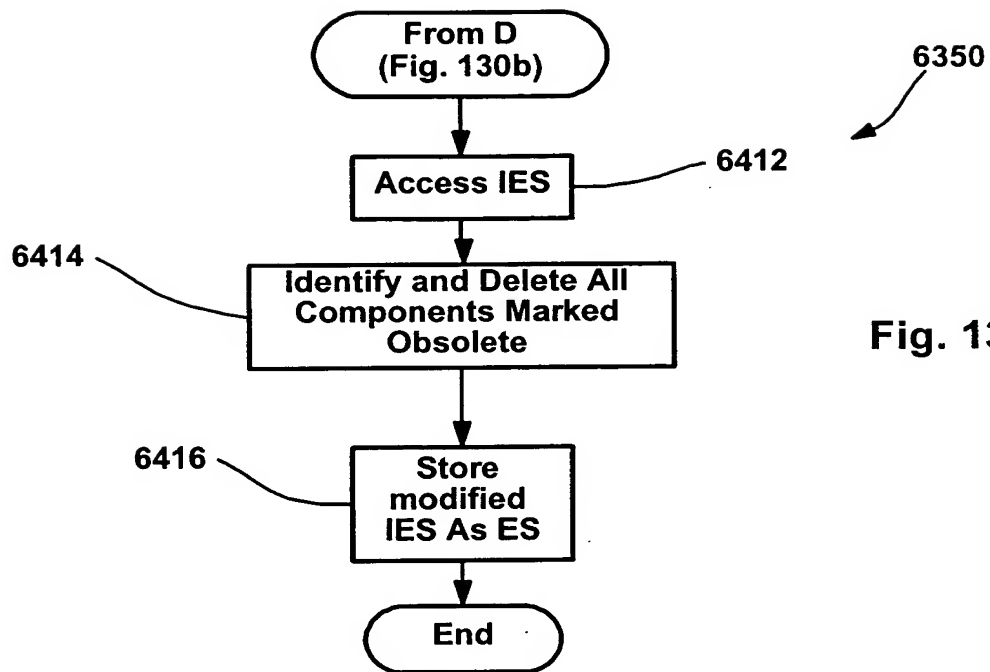
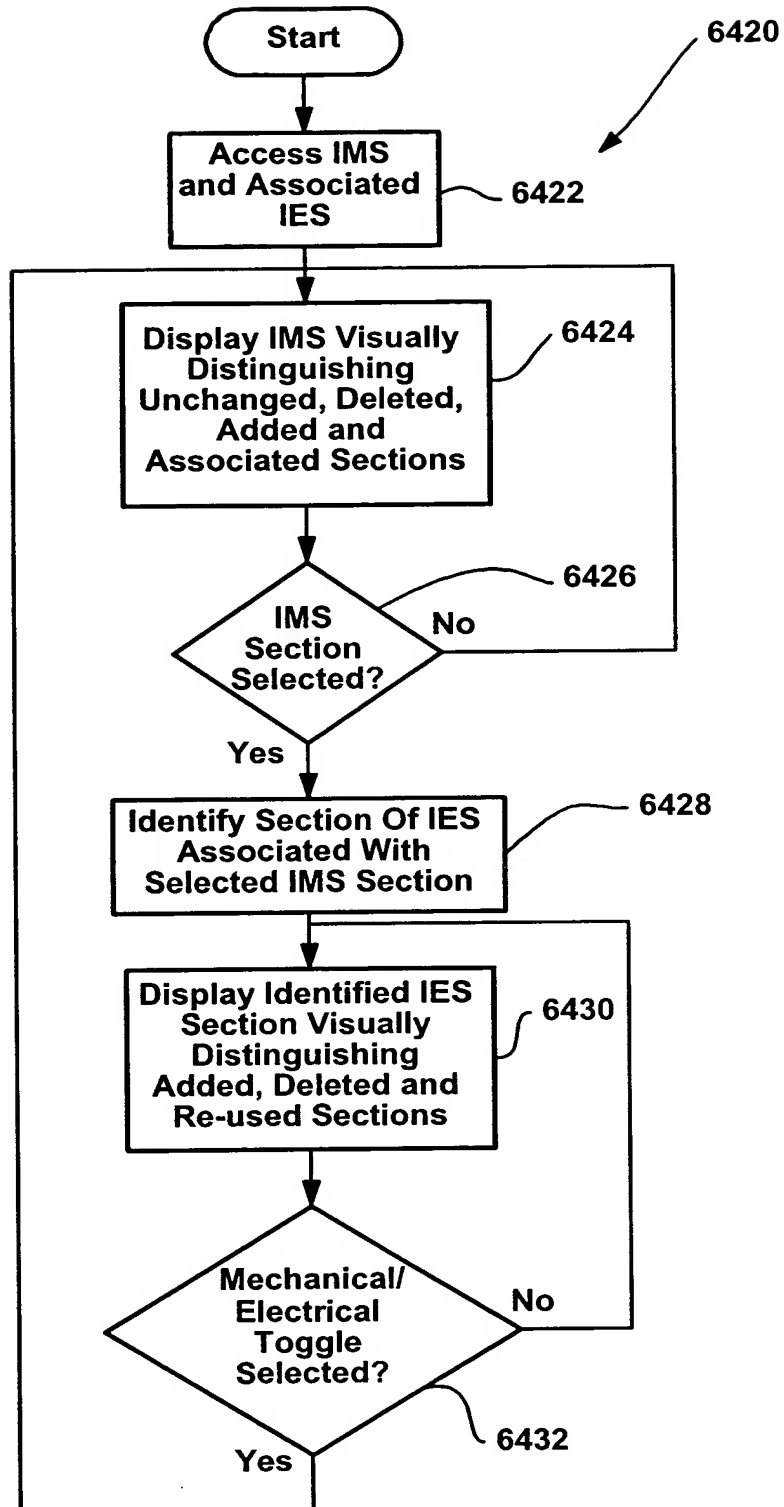
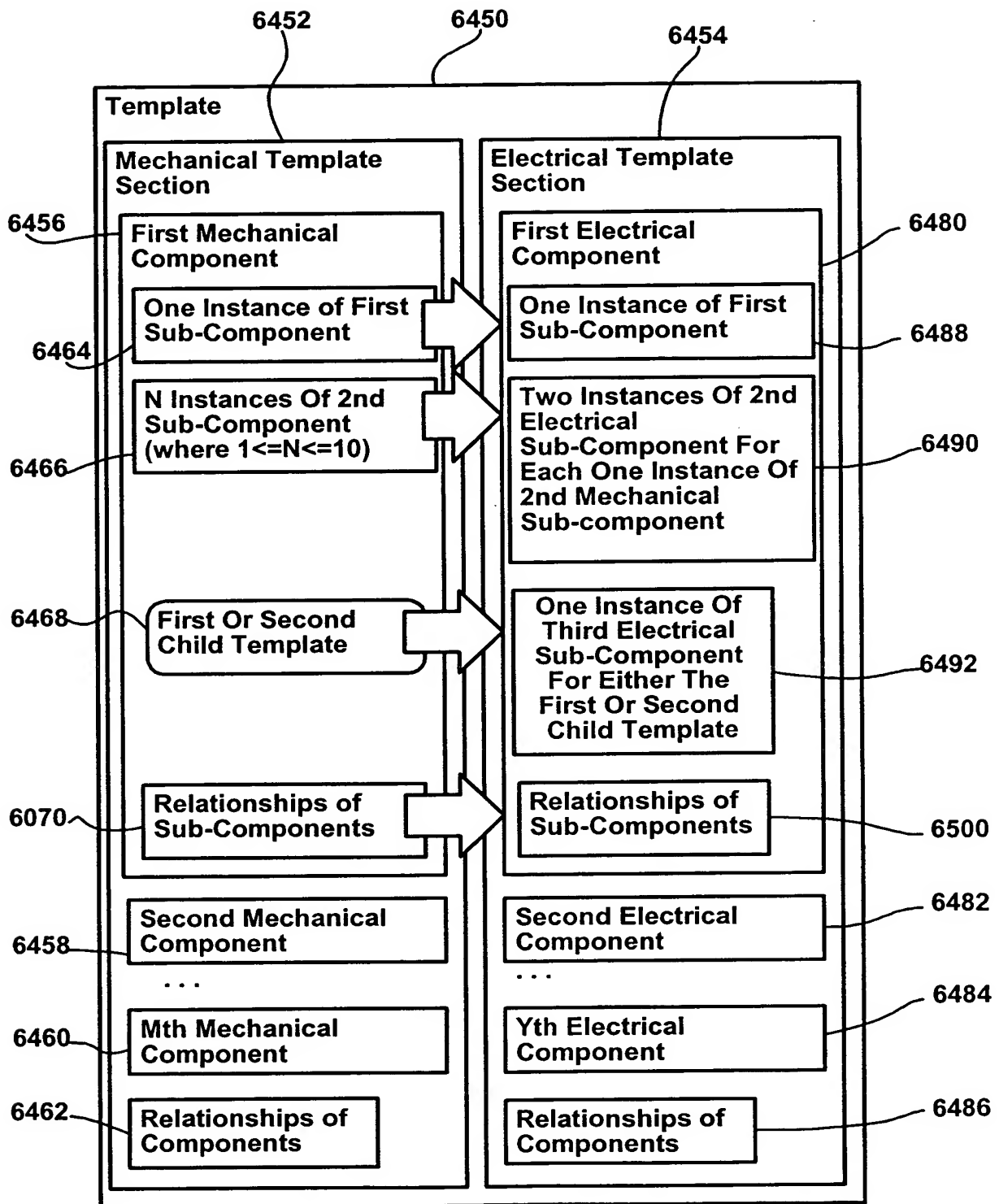


Fig. 130c

Fig. 131





**Fig. 132**